H.R. 5016

NUCLEAR WASTE MANAGEMENT COMPREHENSIVE LEGISLATION—BOUQUARD/LUJAN PROPOSAL

HEARINGS

BEFORE THE

SUBCOMMITTEE ON
ENERGY RESEARCH AND PRODUCTION

OF THE

COMMITTEE ON
SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

NINETY-SEVENTH CONGRESS

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H.R. 5016—NUCLEAR WASTE MANAGEMENT COMPREHENSIVE LEGISLATION (BOUQUARD/ LUJAN PROPOSAL)

WEDNESDAY, JUNE 17, 1981

House of Representatives,
Committee on Science and Technology,
Subcommittee on Energy Research and Production,
Washington, D.C.

The subcommittee met at 1:47 p.m. in room 2318 of the Rayburn House Office Building; Hon. Marilyn Lloyd Bouquard, chairman of the subcommittee, presiding.

Present: Representatives Bouquard, Ottinger, Lundine, Wolpe, Lujan, and Goldwater.

Also present: Representative Winn.

Mrs. Bouquard. The meeting will come to order.

Before we begin, the rules of the House require that we ask unanimous consent that photographs and recordings by electronic devices be permitted. If there is no objection, they will at this time be permitted.

Good afternoon, ladies and gentlemen. I am Congresswoman Marilyn Lloyd Bouquard, chairman of the Subcommittee on Energy Research and Production. We wish to welcome our Government witnesses to today's hearing.

We are here today to receive testimony on a bill of considerable significance to the Nuclear Energy Program of the Nation. This bill, the Nuclear Waste Research, Development and Technology Demonstration Act of 1981, was introduced by Congressman Goldwater, Congressman Fuqua, myself, and Congressman Lujan, the ranking Republican member of the subcommittee.

The bill provides for the temporary operation at sites to be selected by the Secretary of Energy of two technology demonstration facilities containing a minimum of 40 full-sized canisters of glassified high level radioactive waste. These wastes will be turned into glass and placed within additional engineered barriers, using known technology.

The wastes will be at sites that will meet all necessary requirements for isolation of the high level radioactive waste. The bill requires the first demonstration facility to be in operation by the end of fiscal year 1987 and the second by the end of fiscal year 1988. The Department of Energy is directed to consult and coordinate with those States where the temporary facilities may be located as well as consult with the heads of other appropriate agencies. The bill specifically prohibits expansion of these facilities into permanent commercial high level waste disposal repositories.

As many of you know, there is widespread consensus in the technical community that disposal of high level radioactive waste is both practical and technically feasible and can be accomplished now. However, almost all agree there are many institutional and political problems that stand in the way of demonstrating the availability of this technology to the American people. This bill is designed to minimize the political barriers and set in place a program to demonstrate that the technology exists for safe and permanent disposal. It also provides data to support the design and construction of full-sized licensed repositories.

This afternoon, we are pleased to have witnesses from Government, industry, and the environmental community. Our witness from the utility is Dr. Linn Draper, who is vice president for Nuclear Technology of Gulf States Utilities Co. I understand that Dr. Draper is representing a broad segment of the nuclear industry in his testimony today.

Representing the geologist point of view is Dr. William Hambleton of the Kansas Geological Society. Dr. Hambleton was actively involved with the high level waste disposal activity at Lyons, Kansas.

Mr. Holmes Brown of the National Governors' Association will be representing the States, commonwealth, and territories.

And Mr. David Berick of the Environmental Policy Center in Washington, D. C., will represent the environmental community.

Before we begin our testimony, I would like to invite Congressman Manuel Lujan to make an opening statement. I would also like to invite Congressman Goldwater, who is the principal author of the proposed legislation, to make a statement. In addition, I understand that Mr. Lundine has an opening statement which he, too, is invited to make. And if others would like to make a statement, they will certainly be provided the opportunity.

Mr. Lujan.

Mr. LUJAN. Thank you, Madam Chairman. I won't take a lot of time because I would like to get to the witnesses as soon as we possibly can.

I would just like to say that I want to thank you for having these hearings. It is one of the areas in which very little has been done, and we need to move ahead with solving the waste problem. Otherwise, we get all kinds of objections to all of the nuclear technology which we must deal with.

I look forward to the witnesses' statements and have some questions that I would like to clear up in my own mind as we move along.

I thank you, Madam Chairman.

Mrs. BOUQUARD. Thank you, Mr. Lujan.

At this time, we recognize a principal author of the legislation, Congressman Goldwater.

Mr. GOLDWATER. Thank you very much, Madam Chairman. And thank you for calling these hearings on H.R. 1909, the Nuclear Waste Research, Development and Technology Demonstration Act of 1981. These hearings are the first step in a journey this Congress should take to enact a nuclear waste management policy.

Past Presidents, and Congresses have wrestled with this issue. During the last Congress, we almost completed a conference which would have resulted in a comprehensive waste management policy act. However, the conferees failed to reach an agreement in the waning hours of Congress. Since then, there has been very little improvement in the nuclear waste situation.

The Department of Energy has issued a report outlining the magnitude of our nuclear disposal problem. It is still an enormous problem. We could have nearly 100,000 tons of high-level nuclear waste to dispose of by the year 2000. This would result in about 45,000 canisters if it were all vitrified.

Looking at the economic value of the oil equivalent of spent fuel, by the year 2000, spent fuel inventory will be about 72,000 metric tons, equivalent to about 10 billion barrels of oil. And at $40 a barrel, we are talking about $400 billion equivalent.

The size and magnitude of the problem, I think justifies expedited action on the part of the Government to address ourselves to this problem. I would like to note one new development that has a bearing on our hearings. The NRC will issue today a proposed rule for comment concerning the technical requirements for storage of high-level nuclear waste. This has been in draft for 1 year.

The NRC has attempted to take an approach similar to the bill H.R. 1909, but they have arrived at a different type of standards than the one proposed in this bill. The NRC would propose the waste package must be able to retain the radioactivity for 1,000 years. In the bill 1909, we provide that the engineer barriers must have a design life at least as long as the time period needed for the health hazard to become comparable to the health hazard used to generate such wastes. In other words, we would use the standard of equivalency to the original ore bodies. We shall hear more from the NRC regarding this proposed rule and their further comments on the bill H.R. 1909 tomorrow when they testify.

However, I also wish to note with concern the fact that the Environmental Protection Agency has yet to issue the standards which they must propose. I have been informed that the EPA has been working on these standards for 2½ years, but has not yet issued their rule for comment. DOE and NRC must have EPA standard for allowable amounts of radiation in the environment in order to adequately design and monitor these demonstration facilities for testing disposal technology.

Madam Chairman, I hope that these hearings indicate that we will be able to quickly move on the bill H.R. 1909. As you know, the bill establishes the needed research and development program for nuclear waste disposal technologies which must be in place no matter what path our waste management policy ultimately will take.

I know there are still many issues in the bill, but no issue should be so difficult as to stop this important research and development proposal. Hearings should also show that there is a general consensus that we should be doing an accelerated research and development program as this bill calls for.

Madam Chairman, I again thank you and look forward to hearing from our distinguished witnesses today and tomorrow.

Mrs. BOUQUARD. Thank you, Mr. Goldwater.

Before we hear from our witnesses, other members of this committee have opening remarks. Mr. Lundine will be recognized for his opening remarks.

Mr. LUNDINE. Thank you, Madam Chairman.

I would like to ask unanimous consent that my written remarks appear.

Mrs. BOUQUARD. Without objection.

[The opening remarks of Mr. Lundine follow:]

Statement
Congressman Stan Lundine

Energy Research and Production Subcommittee hearings on H.R. 1909
June 17, 1981

I am pleased to see this subcommittee begin early in this Congress to focus on our national radioactive waste management problem. I have long been an advocate for the evolution of a comprehensive and action-oriented national plan to provide for the safe handling and ultimate permanent disposal of radioactive wastes.

As you are aware, I have introduced legislation, H.R. 1993, which is also pending consideration by this subcommittee and unlike H.R. 1909 would establish a comprehensive national policy on radioactive waste management. My bill calls for the development of a Mission Plan which would define the necessary research and development steps to lead us logically and in a cost-effective manner toward our goal of the development of permanent waste disposal facilities.

I believe it is critically important to link our research and development efforts to a permanent disposal plan and that these efforts be defined and justified within an overall programatic plan for permanent disposal. My legislation would build on the process began over the past four years to create a National Plan for radioactive waste management and disposal, and in so doing, insure that we have cost-effective, technically sound, and institutionally acceptable research and development goals.

Because of my strong belief that any legislation which is enacted by this Congress must be comprehensive, I have urged the Chairwoman of this Subcommittee, Mrs. Bouquard, to also schedule hearings on H.R. 1993.

Today I would like to reiterate my request for the Chairwoman to schedule hearings on H.R. 1993 without further delay so that the members of this subcommittee and full committee might have the benefit of testimony on and examination of a broad and comprehensive approach to radioactive waste management. I feel this is particularly important in light of testimony this subcommittee received in February from various witnesses, all of whom testified to the importance of an integrated and comprehensive approach to radioactive waste management. I might add, that a quick review of the written testimony we will received here today from our witnesses indicates to me an ongoing concern with the narrow scope of H.R. 1909.

It is important that the Department of Energy have available the necessary avenues to secure all the relevant generic data necessary to proceed with the characterization of sites for permanent disposal and to resolve any generic technical issues that are necessary to move an application for licensing of such a permanent disposal facility through the Nuclear Regulatory Commission. However, I believe that H.R. 1909 is aimed more at an effort to build public confidence regarding our ability to permanently dispose of radioactive wastes, than to address these relevant technical issues.

I do not dismiss lightly the need to build public confidence and to demonstrate that serious efforts are underway to resolve our radioactive waste management problem. However, I do not believe that simply putting several hundred canisters of nuclear waste in the ground will necessarily build public confidence, particularly if acceptable institutional safeguards are not available to resolve issues of concern to impacted states and localities.

Specifically, I have serveral concerns regarding the provisions of H.R. 1909, as currently drafted.

First, the activities authorized in the bill are not justified within the context of a plan to provide a permanent disposal system. In fact, the significant commitment of federal funds that will have to be made to carry out the provisions of this act will likely result in a delay in progress toward implementation of a permanent disposal system.

Second, the size and scope of the facilities authorized in the bill is open-ended and undefined. Under the provisions of the bill, wastes could stay implaced in these facilities indefinetely at the Secretary's discretion. In effect then, these facilities would become permanent disposal facilities, without the benefit of scrutiny by the Nuclear Regulatory Commission licensing process or significant institutional safeguards.

Third, the bill does not address the question of the disposition of spent fuel, currently our most serious radioactive waste management problem. It requires that only reprocessed high level wastes be put in the demonstration repositories. Therefore, the bill assumes commercial reprocessing, an unlikely undertaking in the current economic climate.

In summany, I do not believe this bill goes far enough to define technical issues or to resolve institutional issues necessary for a successful permanent disposal program. Therefore, I urge consideration of a more integrated program legislative plan during these hearings and in future weeks.

Mr. **Lundine**. Let me just briefly say that I am pleased to see that the subcommittee is beginning early in this Congress to focus our national attention on the radioactive waste management problem. I am an advocate for an action-oriented national plan to provide for the safe handling and ultimate permanent disposal of radioactive waste.

As you know, I have also introduced legislation, H.R. 1993, which is pending consideration by this subcommittee and would establish a national comprehensive policy on radioactive waste management. I think it is critically important to link our research and development efforts to a permanent disposal plan that these efforts be defined and justified within an overall programmatic plan for permanent disposal.

Because of my strong belief that any legislation which is enacted by this Congress must be comprehensive, I have asked if you would consider hearings on the bill I have introduced as well as any others addressed to that comprehensive approach. Testimony this subcommittee received in February from various witnesses indicated the importance of an integrated and comprehensive approach to radioactive waste management. I believe that H.R. 1909 is a part of that, and it is an effort aimed at building public confidence regarding our ability to permanently dispose of radioactive waste and also as much to do that as to address any technical issues.

I don't dismiss lightly the need to build up public confidence, but I do think that we are going to need to go beyond putting several hundred canisters of nuclear waste in the ground to build that public confidence, particularly, I think we are going to have to have acceptable institutional safeguards that are not available to resolve issues of concern to impacted States and localities.

I look forward to these hearings and to addressing some of the concerns that may be raised regarding H.R. 1909. And I again commend you for focusing the attention of this subcommittee on this very important question.

Mrs. **Bouquard**. I thank the gentleman. I am sure we will not stand in the way of legislation on a broader scale, but in view of the scope of the jurisdiction of this subcommittee, I think we should limit our work to this bill.

There are other members of this subcommittee that also have opening remarks. Mr. Wolpe.

Mr. **Wolpe**. Thank you, Madam Chairman.

I want to begin first by complimenting you not only for calling these hearings at this point, but the array of witnesses that will be testifying today because I think the panel is balanced; I think it has particular importance in light of the very substantial controversy that attends this question. This has been a long debate. This has been a debate that I think in which there has been probably more heat than light shed. And the ultimate irony, I think, is that the question of nuclear waste disposal is one that should not divide proponents or opponents of nuclear energy.

The reason very simply is that whatever our future plans may be with respect to nuclear power, we already have accumulated substantial amounts of radioactive waste that need burial at some point.

We have had several hearings in the past of the subcommittee on the subject. And I think it is clear from those hearings that at this point, at least a consensus does not currently exist within the scientific community concerning the technical questions involved in safety and disposing of radioactive waste material.

I think it is clear beyond that that even if such a consensus were to emerge within the months and years ahead, it would be doomed to failure if we do not attain at the same time a political consensus. The concerns that I have with the legislation that is before us today, as much as I applaud the intent and direction is that certain specific revisions of that legislation appear to be an effort to impose arbitrary deadlines on the establishment of nuclear waste repositories and also appear to be an effort to limit in some fashion the degree of public participation, particularly participation of States and local units that will be directly impacted by any radioactive waste site decisions.

We cannot, I suggest, in good conscience prematurely employ particular geologic medium or solidification process due to our desire to find a quick fix to a problem which will be with us for thousands of years.

More to the point perhaps is that the effort to do that—that is, the effort to move overly quickly and to close out full political participation—in my judgment will only be counterproductive. That is, it will only polarize the issue further and intensify the emotional debate that is occurring around this issue and be directly contrary to the interests of this country to achieve a consensus with respect to the manner in which we go about disposal of radioactive waste materials.

So I hope that the hearing today will be the beginning of that process of a development of a consensus without which we will not be able to really successfully address this issue.

I thank you for initiating this dialog.

Mrs. BOUQUARD. I thank the gentleman for his views.

Mr. Ottinger, would you also have opening remarks?

I think for brevity's sake, the extent of the remarks ought to be more brief.

Mr. OTTINGER. Madam Chairman, I think it is good that you are starting hearings on the research and development aspects of nuclear waste. But I feel very strongly we ought to not confine these hearings to H.R. 1909. I think that if we were to pass such a bill, surely, the Senate will be acting on a more comprehensive bill that would get us into a jurisdictional snarl, that is unfortunate.

I don't think you can disconnect the problems as others have said today from the research and development aspect of this with the establishment eventually of a permanent repository.

The bill, as Mr. Goldwater and you and others have introduced it at the present time, contradicts administration policy in that it prohibits the use of the demonstration facility as a part of a permanent disposal facility. I think that that will set us back substantially in time and in cost unnecessarily.

There is no provision for even consultation with the NRC.

Mrs. BOUQUARD. Will the gentleman yield?

Mr. OTTINGER. I will at the appropriate time.

And I think that is a serious matter that will not contribute to the public acceptance of the waste program with the Government. There is no provision for a statement of participation other than consultation and coordination. The bill will be passed; there is a limited State veto.

In the hearings before my Subcommittee on Energy Conservation and Power yesterday, the administration testified, and they favored a State veto of some kind. So I think that in view of the fact that there is tremendous duplication, it would be required to have separate hearings with the same witnesses on the same subject at a subsequent time.

I feel compelled to move that we consider H.R. 1993 as offered by Mr. Lundine and the bill that we passed last year at the same time we consider this legislation.

Mrs. **Bouquard**. I thank the gentleman. I think he is well aware of the fact that I related to him yesterday that we would certainly have hearings on Mr. Lundine's legislation. This is legislation that falls within the jurisdiction of this subcommittee. And I will certainly not stand in the way of legislation on a larger scale.

I would like to remind the gentleman from New York of the purpose of today's meeting. It is to conduct hearings and to hear from witnesses, and I would like to move in that direction.

I would like to recognize——

Mr. **Ottinger**. Madam Chairman, I made a motion that I think has to be disposed of. I disagree with the Chair, and I think that it is a waste of the witnesses' time and the committee's time to have to repeat the same process on related legislation. So that——

Mrs. **Bouquard**. The Chair will not entertain a motion on this subject at this time.

Mr. **Ottinger**. Well, I appeal to the rule of the——

Mrs. **Bouquard**. There will be a vote.

All those in favor of the motion made by the gentleman from New York, say "aye."

[Chorus of "ayes."]

Mrs. **Bouquard**. Those opposed say "no."

[Chorus of "noes."]

Mrs. **Bouquard**. The motion has been made and——

Mr. **Ottinger**. Can we have a show of hands?

Mrs. **Bouquard** [continuing]. In the opinion of the Chair, the "noes" have it.

Mr. **Ottinger**. I would ask for a division on the——

Mrs. **Bouquard**. A division is requested. All those in favor of the motion of the gentleman from New York raise your hand.

All those opposed?

The vote is 3 to 2. And the motion of the gentleman from New York is rejected.

I would like to now recognize the Honorable Larry Winn who is the ranking Republican member of the full Committee on Science and Technology. Mr. Winn is a very conscientious and hard-working member of this committee. His contributions to this committee are certainly great. In the mood of conservation, he has asked that his opening remarks be included in his introduction of our first witness.

At this time, I would like to ask that all of our witnesses proceed to the witness table.

We will receive the testimony of all four of our witnesses and then have our question and answer series.

Mr. Winn.

Mr. **WINN**. Thank you, Madam Chairman.

I will put my opening remarks in the record, but I do want to take this opportunity to introduce to my colleagues Dr. Bill Hambleton, the director of the Kansas Geological Survey, and a professor at the University of Kansas. Dr. Hambleton has been director of the Kansas Geological Survey for many years, serving under both Democrat and Republican administrations in my State.

He is also a member of the Kansas Science and Technology Advisory Committee which has aided me greatly in my work on the Science and Technology Committee.

Dr. Hambleton is experienced in the nuclear waste field, having done the critical analysis of the Lyons, Kans., salt domes during the AEC project there. He has also done extensive work in remote sensing technology.

Dr. Hambleton has provided invaluable service and assistance to the entire Kansas delegation, and I look forward, and I hope my colleagues do, too, to hearing Dr. Hambleton's testimony.

And before we hear the testimony and without his permission—and he may want to veto this—Dr. Hambleton sent me about a week ago an extensive copy of a paper that he presented. The title is, "Historical Perspectives on Radioactive Waste Management." I wonder if this might be included in the record, along with his permission.

Mrs. **BOUQUARD**. Without objection, it will be included in the record.

Mr. **WINN**. I thank the Chairwoman.

[The opening remarks from Mr. Winn follows:]

THE HONORABLE LARRY WINN, JR.

OPENING STATEMENT
H.R. 1909 - NUCLEAR WASTE RD&D ACT
SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
JUNE 17, 1981

I WANT TO THANK THE DISTINGUISHED CHAIRWOMAN OF THIS SUBCOMMITTEE, MARILYN BOUQUARD, FOR CALLING HEARINGS ON THE BILL H.R. 1909, "THE NUCLEAR WASTE RESEARCH, DEVELOPMENT AND DEMONSTRATION ACT OF 1981." ALTHOUGH THIS NATION HAS RECEIVED THE BENEFITS OF NUCLEAR POWER FOR OVER A GENERATION NOW, WE HAVE FAILED TO COME TO GRIPS WITH THE POLICY DECISIONS THAT MUST BE MADE FOR THE HANDLING OF THE WASTES OF THE NUCLEAR POWER PROCESS. LAST YEAR, WE IN THE CONGRESS CAME VERY CLOSE TO ACHIEVING SUCH A POLICY, BUT IN THE WANING HOURS, NO AGREEMENT COULD BE REACHED. THIS SITUATION HAS ENDURED FOR MANY YEARS, AND WE HAVE NO INDICATION WHEN IT WILL BE RESOLVED.

THEREFORE, I AM DELIGHTED TO SEE THE SUBCOMMITTEE BEGIN HEARINGS ON THIS BILL, WHICH WILL IMPLEMENT THE RESEARCH AND DEVELOPMENT POLICY NECESSARY TO ACCOMPANY ANY NUCLEAR WASTE POLICY WHICH WOULD BE PUT INTO EFFECT. THIS RESEARCH AND DEVELOPMENT PROGRAM MUST BE IMPLEMENTED, NO MATTER WHAT OUR NUCLEAR WASTE POLICY ULTIMATELY WILL BE. I ALSO ENCOURAGE THE SUBCOMMITTEE AND FULL COMMITTEE TO CONSIDER ADOPTING ANOTHER BILL, A MORE COMPREHENSIVE STATEMENT OF WASTE MANAGEMENT POLICY, SOON AFTER WE FINISH OUR WORK ON THIS PRECURSOR, RESEARCH AND DEVELOPMENT BILL.

I ALSO WISH TO INTRODUCE TO MY COLLEAGUES DR. BILL HAMBLETON, THE DIRECTOR OF THE KANSAS GEOLOGICAL SURVEY, AND A PROFESSOR AT THE UNIVERSITY OF KANSAS. DR. HAMBLETON HAS BEEN DIRECTOR OF THE KANSAS GEOLOGICAL SURVEY FOR MANY YEARS, SERVING BOTH UNDER DEMOCRAT AND REPUBLICAN ADMINISTRATIONS IN MY STATE. HE IS ALSO A MEMBER OF THE

KANSAS SCIENCE AND TECHNOLOGY ADVISORY COMMITTEE, WHICH HAS AIDED ME GREATLY IN MY WORK ON THE SCIENCE AND TECHNOLOGY COMMITTEE. DR. HAMBLETON IS EXPERIENCED IN THE NUCLEAR WASTE FIELD, HAVING DONE THE CRITICAL ANALYSIS OF THE LYONS, KANSAS SALT DOMES, DURING THE AEC PROJECT THERE. HE ALSO HAS DONE EXTENSIVE WORK IN REMOTE SENSING TECHNOLOGY. DR. HAMBLETON HAS PROVIDED INVALUABLE ADVICE AND ASSISTANCE TO THE ENTIRE KANSAS DELEGATION. I LOOK FORWARD TO HEARING DR. HAMBLETON'S TESTIMONY.

THANK YOU, MADAM CHAIRMAN.

Mrs. **BOUQUARD**. Dr. Hambleton, would you please begin your testimony?

TESTIMONY OF WILLIAM W. HAMBLETON, DIRECTOR, KANSAS GEOLOGICAL SOCIETY, UNIVERSITY OF KANSAS, LAWRENCE, KANS.

Dr. **HAMBLETON**. Madam Chairman, members of the committee, Mr. Winn: I apologize for the absence of a written statement. I have been traveling. I will attempt to file such a statement with the committee next week when I return to my office.

Mrs. **BOUQUARD**. Without objection, it will be made a part of the record, Dr. Hambleton. Please proceed.

Dr. **HAMBLETON**. I have been associated with the high-level waste program in its geological aspects since about 1965 when Lyons became important and have continued that association through service on subcommittees of the National Academy of Science, an advisory committee to the Department of Energy on the geological aspects of nuclear waste, on Dr. Frank Press' committee from the Executive Office of the President, on the Interagency Review Group Report, and on the Congressional Office of Technology Assessment Committee on Nuclear Waste Management, along with review for the Office of Nuclear Waste Isolation, Battelle Memorial Institute.

I note in all these capacities, I served in an unpaid capacity because I wish to maintain an independent stance and to represent a State's point of view.

The paper to which Congressman Winn just referred—Historical Perspective on Radioactive Waste Management—was an interesting assignment, and far more difficult than I had contemplated. But the one thing that emerges from a review of this program, which date back to 1954, is that it can be characterized by a lack of a consistent national policy and direction.

I compliment this committee and the authors of this bill on their efforts to provide such a strong sense of direction to the high-level waste program. I suggest that a high-level waste research and development facility is needed.

The only site that has been used so far for such a purpose has been Project Salt Vault at Lyons, Kans. And interestingly enough, data from Salt Vault are being extrapolated today to as far away as the gulf coast salt domes, and in the Paradox Basin, Utah. It is the only place where data have been obtained that can be used to determine how radionuclides behave in host rocks.

Lyons was and is unacceptable as a storage site because of problems of regional hydrology and because of problems of rock heterogeneity. That is to say, rocks change from place to place and sometimes within very short distances.

I make this point because I want to come back to it again. Regional hydrology is a big problem, as are rock heterogeneity, salt solution, and mobilization, transport, and fixation of radionuclides in natural systems.

Now, to come back to H.R. 1909, I note a remarkable similarity between 1909 and the Nuclear Regulatory Commission's 10 CFR 60 which has just been released. It requires at least three sites, in two types of rocks of which one shall not be salt.

Also, the DOE's program, as announced by Colin Heath in his statement on March 17 in Los Angeles before the Atomic Industrial Forum, has similarities with these other approaches.

Now, to my specific concerns about 1909: This bill stresses only engineering data and information. I believe strongly that it also should involve geologic studies such as rock mechanics, regional geohydrology, and fracture permeability. All of these aspects of a research and demonstration site should be studied so that we can learn, not only engineering, but also the geological aspects.

I note also that this bill requires that radioactive waste from reprocessing irradiated nuclear fuels in 40 canisters of vitrified material be placed in each of these sites by 1985 and 1987. I ask the committee where these canisters are going to come from. I know of no place other than West Valley where such material is available and note the difficulty of vitrifying waste and placing it in canisters by 1985. I simply don't know how this is going to be done, and I bring this to the attention of the committee.

Another point with which I am concerned is that the bill requires that a research and development facility cannot be converted, expanded or utilized as a permanent facility. I understand very well why this requirement is in the bill, but I assert that good sites for storage of high-level nuclear waste are very difficult to find. I am concerned that having found a good site, the bill requires closure.

That seems to me somewhat unwise because such sites are very, very difficult to find. They are not abundant.

Finally, I will make one point which does not have to do with geology directly. The bill calls for consultation and coordination with States and State agencies. I wonder exactly and precisely how you are going to do that. I haven't found that done very well so far. And the mere statement of it in the bill doesn't guarantee it at all. And I would like to know how it is going to be done.

Thank you, Madam Chairman.

[The paper Historical Perspectives on Radioactive Waste Management, plus prepared statement by M. W. Hambleton follows:]

HISTORICAL PERSPECTIVES ON RADIOACTIVE WASTE MANAGEMENT

By

William W. Hambleton*

Editors note: This paper is of interest to Kansas Water News because groundwater is the most likely avenue by which radionuclides can reach the biosphere from disposal sites.

Introduction

Kenneth Boulding recently wrote an article "On the Virtues of Muddling Through." I was tempted sorely to use the title for this paper. However, "muddling through" does not describe adequately much of the fine effort that has been committed to solution of our radioactive waste management problems. David J. Rose, in a recent issue of the MIT Technology Review, provides us with a more charitable description of the intellectual, social, and technological mismatch of the problems of radioactive waste management and our responses. Faced with the complexities and paradoxes of real problems, we selectively ignore vital aspects and concentrate on only one or a few simple features, and we focus on different times in the future to the exclusion of all others. What Rose calls selective inattention, and different time perspectives have characterized the debate about radioactive waste management, and this debate "sometimes proceeds with the clarity, grace, and intelligence of a duel in the dark with chainsaws."

To the best of my knowledge, a carefully documented history of our radioactive waste management program has not been published. I urge this task upon some stout-hearted historian. This paper is more of a personal odyssey with an historical perspective. It tends to reflect my own involvement with the subject, will lack balance and completeness I am sure, and may include some inaccuracies. It is largely about geology and public policy from my vantage point.

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* Director, Kansas Geological Survey. Presented at a symposium in Madison, Wisconsin, April 24, 1981.

Dimensions of the Problem

Radioactive wastes are produced in a wide variety of activities including research, medical diagnostics, therapy with radiopharmaceuticals, mining of uranium ore, production of special nuclear material, and the operation of nuclear reactors. Wastes consist of radioactive species of almost all chemical elements; they exist as a large number of chemical compounds; some contain naturally occurring radioactive materials and others are man-made; the wastes exist as gases, liquids, and solids. It is, therefore, not possible to characterize the nature of radioactive waste in a simple fashion. Yet for all their variety, radioactive wastes have one thing in common: as long as they remain highly radioactive, they are potentially hazardous. The major types addressed in this paper are spent fuel, the intact fuel assemblies that have served their useful life in a nuclear reactor and have been discarded; high-level reprocessed waste, the waste that results from the processing of spent fuel for recovery of uranium and plutonium; TRU (or transuranic waste), the waste that results from spent fuel processing, the fabrication of plutonium to produce nuclear weapons, and fuel fabrication for recycle to nuclear reactors; and cladding hulls, the undissolved pieces of fuel cladding that remain after processing of spent fuel. Low-level waste, touched upon only briefly in this paper, is contaminated material from many sources that has a low radiation level (less than 10 nanocuries per gram).

I give you a few figures to illustrate the magnitude of the problem. High-level and TRU defense waste amount to something of the order of

20 million cubic feet. Commercial waste, including spent fuel, amounts to something of the order of less than 2 million cubic feet. The total, 22 million cubic feet, equals a cube 280 feet on a side. In terms of sheer bulk, low-level wastes are much more abundant; amount to about 60 million cubic feet from defense activities and about 18 million cubic feet from commercial activities.

The waste generated so far has been stored in tanks or other holding facilities on an interim basis. A current inventory of high-level and TRU wastes consists of defense waste including high-level reprocessed waste stored as liquid and salt cake at Savannah River, South Carolina; as liquid, sludge, and salt cake and as encapsulated cesium and strontium at Richland, Washington; and as liquid and calcine at Idaho National Reactor Testing Laboratory. Defense waste also includes TRU waste stored in a variety of containers or buried in shallow trenches at Savannah River, Hanford, Idaho, and at other DOE sites. Commercial nuclear power waste includes high-level reprocessed waste stored as liquid and sludge at the Nuclear Fuel Services site at West Valley, New York; spent fuel stored at reactor sites, at Nuclear Fuel Services, and at Morris, Illinois, and a small amount of TRU waste stored in solidified form at Nuclear Fuel Services.

The Atomic Energy Commission Era -- Pre-1955 to 1974

The waste problem had its origins in the Manhattan Project of World War II. The Atomic Energy Commission, the outgrowth of the Manhattan Project, pursued two simultaneous courses after the war. On the one hand, support for military purposes required plutonium. On the other hand, a program for peaceful use of atomic energy promoted an increasingly sophisticated nuclear technology devoted to the production of electricity. A common product of both courses is high-level radioactive waste. The Atomic Energy Act of 1954 defined the preemptive Federal authority with respect to commercial nuclear power reactors and nuclear waste. Thus, the AEC was responsible for managing its own waste, and for regulating the waste generated by the commercial nuclear power industry. The only regulation ever issued by the AEC on disposition of high-level commercial waste required solidification at commercial reprocessing plants within five years, and shipment to a non-existent Federal repository within ten years. Lacking the appeal of reactor development, waste management within the AEC received relatively little budgetary support or management interest. In 1961, the waste management budget was only $9.2 million.

However, as early as 1954, the AEC was sufficiently concerned about the problem to ask the National Academy of Sciences to evaluate methods for burying waste. In late 1955 a permanent Committee on the Geological Aspects of Radioactive Waste Disposal was established in the Academy's Division of Earth Sciences. All members were prominent earth scientists. The Committee's first report, issued in 1957, contributed a new idea favoring disposal in mined salt. The Committee argued that salt flows plastically and can heal itself, affords radiation protection, has a high thermal conductivity, is usually found in seismically stable areas, and has had no contact with water for millions of years. However, the Committee also argued that the AEC was pursuing expedience at Hanford, Savannah River, and the Idaho Nuclear Reactor Test Site, and could jeopardize the safety of future generations. Thus, it came in conflict with prevailing wisdom at AEC. Nevertheless, the AEC was sufficiently interested in the concept of disposal in salt that Oak Ridge National Laboratory was requested to develop plans for a study. Ultimately, the Carey mine at Lyons, Kansas was chosen for this purpose. Beginning in 1965, the Lyons mine was instrumented for study of rock mechanics, heat flow, and radiation flux; and spent fuel elements, along with electric heaters, were installed to represent solidified waste. Thus began Project Salt Vault. Consultations were held with local citizens, and regular mine tours were conducted for the general public. Project Salt Vault was my first introduction to radioactive waste disposal.

In May, 1965, the National Academy Committee visited Hanford, Savannah River, Idaho National Reactor Testing Site, and Project Salt Vault in Kansas. The Committee found no fault with Salt Vault, but it was exceedingly critical of Hanford, Savannah River, and Idaho Nuclear Reactor Test Site, stating that no site had been chosen with safety in mind, and that economic expediency seemed to prevail. The report also was cool to a proposed storage site in granite under Savannah River, and worried that joints and fractures could endanger the Tuscaloosa aquifer directly above bedrock, and Savannah River itself. The AEC suppressed the report, and disbanded the Committee in mid-1967, stating that it was no longer needed "Because a major part of the AEC ground disposal research and development program is reaching a successful conclusion." The studies at Project Salt Vault also were concluded in 1967.

In March of 1968, the AEC accepted a new proposal from the National Academy of Science concerning an overview committee. Burned once by forthrightness, the AEC retained the right of veto over the new committee membership and the publication of reports. The new committee was established under the Academy Division of Chemistry and Chemical Technology, and with few exceptions its membership had strong ties to the nuclear power industry. Only one member of the old committee was retained, and the membership exhibited minimal expertise in geology. The Committee issued three reports, all supportive of the AEC.

In 1970, the affairs of the AEC, Oak Ridge National Laboratory, the National Academy Committee, the Kansas Geological Survey, and the State of Kansas became inextricably intertwined. On March 24, 1970, AEC representatives met with Governor Robert Docking to propose that the abandoned Carey salt mine become a repository for high-level waste. The success of the earlier tests, seismic stability of central Kansas, availability of 300-foot section of salt overlain by 800 feet of impermeable shales, the opportunity to use the abandoned Carey mine, and the hospitality of the people of Lyons were cited in support of the proposal. Governor Docking asked appropriate questions concerning safety of the site, and received reassuring answers. This revived interest in Kansas undoubtedly was the product of a fire at the AEC's weapons facility at Rocky Flats, Colorado. The transuranic debris from the fire had been sent to Idaho, but promises had been made to the Idaho Congressional delegation that the debris would be moved by 1980 to a Federal repository, presumably at Lyons.

The minutes of the meeting reached the Kansas Geological Survey, and at a subsequent meeting, Governor Docking was convinced that the problem was not so simple, particularly with respect to the possibilities for groundwater access to the mine. Governor Docking was sufficiently concerned that he committed himself to thorough technical evaluation of the proposal.

Meanwhile, a subcommittee of the National Academy Committee was in the process of completing a report on Disposal of Solid Radioactive Waste in Bedded Salt Deposits. Concerned by the hint of opposition to Lyons, now the focus of the report, the subcommittee invited the State Geologist of Kansas to serve on the committee. Following a May, 1970, meeting at Oak Ridge National Laboratory, the subcommittee met on June 16, 1970, with Kansas representatives in Lawrence for discussions. During the conference, John Erlewine, Assistant General Manager of the AEC, held a press conference in Topeka and announced the tentative selection of Lyons for a repository. Even the subcommittee was embarrassed by this action. Nevertheless, the subcommittee issued its report in November, 1970, and announced that bedded salt is satisfactory for waste disposal _if the salt meets design and geological criteria_, and that the Lyons site is satisfactory _subject to development of additional confirming data and evaluation_. The caveats became a part of the report only because of strenuous Kansas efforts to modify the content.

Then began a period of acrimonious and emotional debate. John Lear wrote a paper about "Radioactive Ashes in the Kansas Salt Cellar" in the _Saturday Review_. It used inflammatory terms such as "ashes of atomic furnaces," "atomic moonshine still," and "Welcome to Kansas, home of beautiful women and the National Nuclear Waste Dump. Please be careful." Emotions ran high as Kansas congressmen entered the debate in press releases, letters to the AEC, and at hearings before the Congressional Joint Committee on Atomic Energy. In August of 1970, the AEC agreed to fund a study of the Lyons site by the Kansas Geological Survey. The final report of the Geological Survey was issued in March, 1971. It dealt with the inadequacies of experimental data, and identified specific hydrologic problems. Subsequently, the American Salt Company reported that it had lost all circulation of water during a hydraulic mining operation in its nearby mine. One should recall also that the National Environmental Protection Act (NEPA), passed in 1969, now required an Environmental Impact Statement for the site. This statement received severe criticism. By February, 1972, the repository in Kansas was unofficially dead.

Under a new AEC director of the Division of Waste Management and Transportation, the notion of an engineered surface storage facility was developed. This policy, announced in May, 1972, never was implemented.

A period of hiatus and quiet descended upon the radioactive waste management program for nearly two years. During this time, the AEC made one final effort to find alternate sites in Kansas. Additionally, attention began to focus on the Permian Salado salt of the Delaware Basin in southeastern New Mexico; and the U.S. Geological Survey began to look at Gulf Coast salt domes, and the Pennsylvanian salt of the Paradox Basin in east central Utah. However, this quietude also presaged major changes in national energy policy. Events elsewhere produced the OPEC oil embargo in 1973, and a policy shift toward energy independence.

Energy Independence -- 1974 to 1976

Following the OPEC embargo, Congress passed the Energy Reorganization Act of 1974. The conflicting interests of the Atomic Energy Commission in weapons, commercial nuclear reactor development, promotion, and regulation; and the dispersal of energy research and development functions among other agencies of the Federal government, caused the Congress to create the Energy Research and Development Administration

(ERDA), and place regulatory functions under a new Nuclear Regulatory Commission (NRC). Thus, ERDA acquired responsibility for commercial radioactive waste disposal programs, NRC acquired licensing and regulatory responsibilities for such programs, and EPA retained authority to set standards under the 1969 National Environmental Protection Act. In ERDA, the National Waste Terminal Storage Program was created, with major responsibility remaining largely at Oak Ridge National Laboratory under management of Union Carbide Corporation. The budget was increased to $94.7 million in 1974 and rose to $165.6 million by 1976. My personal interest returned to the program when ERDA requested the Association of American State Geologists to set up a State Geologists Technical Review Group for overview of the geological aspects of waste management programs. I became the chairman of the Group. Early on, the Group stated strongly its wish for independence, noting that staff geological presentations made the Group prisoner to staff interpretations. We insisted on seeing the evidence in the field.

ERDA again reviewed options including deep-sea, transmutation, deep-well, rock melting, outer space, and Antarctic disposal. These exotic options were placed on the back burner, and emphasis was concentrated upon salt and sites at government installations. Major effort was placed on evaluation of the site known as the Waste Isolation Pilot Plant facility (WIPP) in the Permian Salado Formation of the Delaware Basin near Los Medanos in southeastern New Mexico. This project was put on a fast track, and was to be designed to accept defense waste. New Mexico State government officials and the public were cultivated assiduously in order to guarantee acceptability. Another major effort was undertaken to study the possibility of placing waste in the basalts (volcanic flows) of the Hanford Reservation in Washington. The effort was identified as the Basalt Waste Isolation Project (BWIP). Additionally, the Nevada Test Site was scrutinized carefully for waste disposal in the Eleana shale, and Climax granite stock, and the tuffs. These last two sites had marked advantage because of prior nuclear testing and Federal government ownership.

Preliminary studies were also undertaken in the so-called Salina Basin of Michigan, Ohio, Pennsylvania, and New York, with primary emphasis focusing on the Michigan part of the basin. The host rock is the bedded salt of the Salina Group of Silurian age. Studies of the Pennsylvanian Paradox salt of the Paradox Basin in southeastern Utah were expanded, and screening and evaluation efforts were intensified in the interior Gulf Coast salt dome areas of Texas, Louisiana, and Mississippi. Further evaluation of the Permian Basin in Oklahoma and Texas led to increased interest in the Texas Panhandle, particularly the areas known as the Palo Duro and the Dalhart basins.

Some of the ambience of these investigations is worth reviewing. ERDA and Union Carbide were becoming disenchanted with each other. ERDA was not completely satisfied with Union Carbide's program management, and Union Carbide had begun to worry about its corporate image. Public confidence in the Federal government's ability to manage waste disposal had waned, and increasingly decisions were challenged by the states and public interest groups. Access to private property for area investigations had become difficult. The development of commercial nuclear power plants slowed under the NEPA process, and environmental groups began to see linkages between power plant development and radioactive waste storage. In short, absence of storage became a powerful argument against licensing of new power plants. In late 1975, Oak Ridge Laboratory proposed drilling a $1 million test hole through salt in northeast Michigan's Alpena County. Having had one disastrous experience in Michigan relative to a proposed Navy submarine communication system, Oak Ridge personnel arranged extensive discussions with State officials. Unfortunately, one member of Congress seemingly was left out of the process, and he went public with accusations of secret meetings. By March of 1976, the Federal government retreated again; and in dismay that its best efforts had failed. On the positive side, there was increasing recognition of the need for complete geologic investigations in areas of potential sites, and awareness of the problems of potential salt dissolution and other geohydrologic problems. Unfortunately, ERDA itself had minimal geological competence. Parenthetically, the ERDA staff found legal reasons why the State Geologists Technical Review Group could not serve in an advisory capacity, and the activities of the Group were halted.

Department of Energy Organization Act -- 1977 to 1980

To his credit, President Carter, beginning in 1977, focused strongly on resolving the problems of radioactive waste management. The Congress passed the Department of Energy Organization Act of 1977, and created a new Department of Energy that merged the functions of ERDA and many other federal energy agencies. Within DOE, the Office of Waste Isolation was created and the Federal government began anew to deal with waste problems. Shortly thereafter, the association with Union Carbide was terminated, and Battelle Memorial Institute of Columbus, Ohio became a major contract manager for the program. The focus of this program was centered in its Office of Nuclear Waste Isolation (ONWI). My personal interest was revived when DOE found a way to reactivate the State Geologist Technical Review Group through a contract with the National Governors Association. Additionally, I agreed to serve on the advisory Geological Review Group to Battelle's Office of Nuclear Waste Isolation, and became much more intimately associated with field investigations.

In 1977, the President also issued two policy decisions that were to have major impact on the waste programs. These included indefinite deferment of the processing of spent fuel from commercial reactors in order to prevent proliferation of plutonium in the environment, and the offer of the Federal government to take title to spent reactor fuel, including some foreign fuel. These policy decisions changed greatly the design plans of potential disposal sites, for now larger volumes of spent fuel rods with a higher content of uranium and plutonium would need to be accommodated.

In 1977, as part of the National Energy Plan, the President also ordered a review of the nuclear waste management program, and later created the Interagency Review Group (IRG), which included representatives of key Federal agencies. A Review Committee was established under the Science Advisor in the Executive Office of the President to Assist in shaping the IRG's draft reports. I served on that Review Committee. The IRG, formally established in March, 1978, was to formulate by October, 1978, recommendations for the establishment of an administrative policy with respect to long-term management of nuclear wastes and supporting programs to implement the policy. The IRG worked assiduously, but did not submit its report until March, 1979. Service on the Review Committee acquainted me with the complexity and difficulty of meeting

Presidential directives. My schedule involved trips to Washington every week or two for a number of months. Draft reports, sent to me for reading and review, usually arrived at my home by express mail just before I departed for Washington, or were found at the desk in my hotel. Much of the reading of the draft reports took place, therefore, in the wee hours of the night and early morning in the hotel after my late arrival in Washington. Committee discussions the following morning often revealed that changes in objectionable parts of a draft report already had been incorporated in a new draft.

Nevertheless, the IRG report was the most comprehensive assessment of the radioactive waste disposal problem that had been undertaken in the history of the program. In a general way, it concluded that high-level waste can be disposed safely in geologic media, reprocessing is not required, an early demonstration project should be undertaken at the WIPP site in New Mexico, the target date of 1985 for initial operation of a repository probably could not be met, responsibility should remain with the Federal government subject to NRC licensing, the NEPA process is essential and should be strengthened, and that management and budgetary constraints should be removed. My own responsibilities dealt more with the alternative technical strategies, evaluation of the status of geologic knowledge, and the introduction of systems and multiple barrier concepts to the problem of waste disposal. Four disposal strategies were offered. The first three provided that only mined repositories be considered, but offered host rock options ranging from only salt to a wide variety of geologic environments. The final strategy provided for a choice among mine repositories and other technical options. The strategies progressively increased the span of time for a final decision. The IRG also recommended the creation of a State Planning Council in order to bring state participation more fully into the planning and decision process.

In October, 1979, the NRC issued a proposed rule-making in response to a May decision of the U.S. District of Columbia Court of Appeals in the matter of the State of Minnesota vs. NRC. The Court remanded a licensing action to permit increased spent fuel storage at Vermont Yankee and Prairie Island nuclear power plants. The NRC now proposed to engage in "waste confidence rule-making" to determine the "degree of confidence in the future availability of off-site storage or disposal sites for spent nuclear fuel." The DOE was obliged to prepare its case, and I assisted in the review of the 600 page document. After two years, the NRC has not yet decided if it has any confidence.

By Executive order during February of 1980, the President created the State Planning Council on Radioactive Active Waste Management under the chair of Governor Richard Riley of South Carolina, with Kansas State Senator Paul Hess serving as vice chairman. The 18 member Council includes governors, state and local elected officials, a tribal government representative, and the heads of four key executive agencies. A policy of state consultation and concurrence was articulated. Additionally, the DOE was directed to adopt a program of technically conservative siting of repositories, and the strategy of a number of potential repository sites in a variety of different geologic environments. The President also cancelled the WIPP program in New Mexico, but allowed the site to remain as a potential candidate.

Meanwhile, the Congressional Office of Technology Assessment was assigned the task of preparing a report on the management and disposal of commercially generated spent fuel and high-level radioactive waste. The membership of the advisory committee includes lawyers, economists, sociologists, nuclear engineers, and one geologist. I am the geologist. This assignment has been one of the most interesting I have undertaken. The subject matter is much broader in scope than any of the previous federally-sponsored studies. Questions addressed include the pace of repository development; policy toward potential resource value of spent fuel; equity of distribution of costs, risks, and benefits; the appropriate role of the Federal government; the rights of state and local governments; the organizational capacity of the Federal government to exert sustained effort; credibility of Federal commitments; treatment of non-radiological impacts; community compensation; assurance of continuing adequate funding; foreign policy implications; and development of consensus about safety standards. The report addresses thoroughly the problem of conflict between safety and timing, seems to suggest greater reliance on away-from-reactor surface storage, and moves the operation of the first underground repository further into the future. It does suggest a national screening process for location of repositories, an approach that I have long advocated, and recommends a phased approach to repository development. The first phase is development of a research facility for demonstration of the safety of the process. Following completion of this effort, a small-scale pilot plant site is to be developed for extended test of research and development concepts. Finally, a full-scale repository would be opened. The pilot plant and full-scale repositories would be licensed by the NRC. Upon completion of work at the research and development facility and at the pilot plant facility, the facilities would be closed. One of my difficulties with this Committee has been to convey understanding that rocks are heterogeneous. That is to say, rocks change from place-to-place. I find myself in disagreement with this part of the draft report because I cannot imagine that having found a suitable location for a pilot plant, one would then close it and seek a new facility. In other words, in the new facility one would realize all of the uncertainties of geological heterogeneity that had been resolved at the first location. I am not at liberty to disclose the content of the draft report in detail, but trust that you will see it sometime during 1981.

Current Affairs

Let me now give you a brief summary of where things stand as I perceive them. A draft National Waste Management Plan has been circulated for comment. This Plan has not been released to the public to the best of my knowledge. The NRC has issued 10 CFR 60, the rules and regulations governing procedures for licensing. These procedures require that (1) exploratory shafts be developed and underground examination of sites take place prior to consideration of a license application, and (2) at least three such sites be examined in at least two different rock types, and at least one of these rock types shall not be salt. Rules and regulations containing guidelines are still only in tentative draft. Great uncertainties yet exist concerning jurisdiction for low-level and high-level waste. In other words, the decision system for disposal of radioactive waste still is in some disarray.

The deliberations of the State Planning Council have not seen much daylight so far; many states have passed restrictive legislation concerning disposal of high- and low-level wastes within their boundaries and have restricted or limited transportation of wastes; the Congress is considering a wide variety of bills that will provide for some kind of veto power by the states; and the legal arguments concerning states' rights in this arena have intensified.

At the geological level, the DOE continues to operate with a very small staff, relying upon a decentralized organization and extensive use of contractors. I am pleased to note that two geologists have been added to the Division of Waste Isolation, bringing the total number to three. At least I have found people with whom I can talk, and they are advocating stronger use of the State Geologists Technical Review Group.

Reports continue to pour out of DOE, NRC, EPA, and all of their contractors. I receive most of these reports, and now have accumulated about 20 lineal feet of publications relating to nuclear waste management. This is in addition to the material that I already have sent to University archives. These reports are accumulating at an exponential rate, and now average approximately 5 lineal feet per month. The Kansas Geological Survey Librarian is very busy.

Let me give you a brief summary of the geological investigations. Access to private property still is very difficult for DOE contractors. In fact, the fundamental data from Project Salt Vault are extrapolated to salt studies as far away as Louisiana and Utah because DOE has been unable to open a new laboratory in salt.

I provide a quick summary of investigations with respect to salt. A report has been issued on the Salina Basin of Michigan, Ohio, Pennsylvania, and New York. No further studies in this area are contemplated at this time. Effort in the Texas Panhandle has concentrated on the Palo Duro Basin, and site choices are being narrowed. Studies in the Paradox Basin of Utah, a region of collapsed salt anticlines, have narrowed choices to several areas that meet design criteria. Salt dome choices in Texas, Louisiana, and Mississippi have been narrowed from 125 to the Vacherie and Rayburns Domes of Louisiana, the Keechi, and Oakwood Domes of east Texas, and the Richton, Cypress Creek and Lampton Domes of Mississippi. These choices will be restricted to one or more domes, probably in the near future. Work continues at the WIPP site at Los Medanos, New Mexico.

At the BWIP site in basalt in the Pasco Basin on Hanford Reservation, a test facility has been constructed to determine the thermal-mechanical response of fractured basalt, and is being designed for a demonstration with spent fuel. At the Nevada Test Site, a demonstration of spent fuel emplacement, storage and retrieval, and radionuclide migration is being undertaken in the Climax granite, but this area has been ruled out for use by defense requirements. Volcanic tuffs in the southern part of the site are being investigated, including use of a tunnel to study water migration. DOE has continued studies at the Stripa granite mine in Sweden to determine the thermal-mechanical-hydrological response of fractured granite at significant depth. Excavation technology, blast damage assessment, and structural geology are being studied in a mine of the Colorado School of Mines. Cooperative projects also are being undertaken at the Asse Project in Germany and at the Okla site in Gabon. This latter site is a place where an ore body actually went critical in the past, and migration of radionuclides can be studied.

All of these studies are using extensive geologic expertise in both field investigations and reviews. The geological problems remain, from my point of view, salt dissolution, geohydrology, and interactions of wastes with host rock. In other words, one of the biggest gaps in geological knowledge remains understanding of the processes of mobilization, transport, and fixation of radionuclides in host rocks.

I have long been concerned that well-known search strategies have not been employed in seeking repository sites. Such a strategy is a little like looking for a non-ore body; that is, a place where everything is absolutely dull geologically. A beginning has been made, and the DOE is undertaking screening of crystalline rocks along the eastern seaboard and in the shield areas of Minnesota and Wisconsin. However, these screening studies now require state consultation and concurrence, and many difficulties remain.

What role will the Reagan administration play? A clue can be found in a March 17, 1981 speech by Colin Heath, Director of the Office of Waste Isolation of DOE, to the Atomic Industrial Forum. With suitable qualifications, he predicts a budget increase of $42 million dollars for a total of $206 million, formal definition by Congress as to the rights of state and local governments, and a full-scale licensed repository in the period 1997 to 2006. The DOE agenda concentrates on intensive site investigations at three specific locations; probably Hanford, Nevada Test Site, and a third in salt. By the end of 1981, a choice will be made between the Palo Duro and Paradox Basins for bedded salt, and the salt dome possibilities will be narrowed. During 1983, construction of exploratory shafts should take place at three alternate locations. Observations at depth will allow designation of one site as a test and evaluation facility for emplacement of several hundred canisters of waste. The decision dates will be pushed nearer to the present than contemplated by the OTA report.

The history of radioactive waste management is one of geological, sociological, political, and economical problems. Not the least of these problems are the sociological and political aspects; the need for a national consensus is evident. Furthermore, litigatious and polarized as we are, compromises must be sought. Legal solutions, unfortunately, produce winners and losers. Eventually, all are losers unless compromises are found. The problem is pressing, and we can no longer afford the luxury of a duel in the dark with chainsaws.

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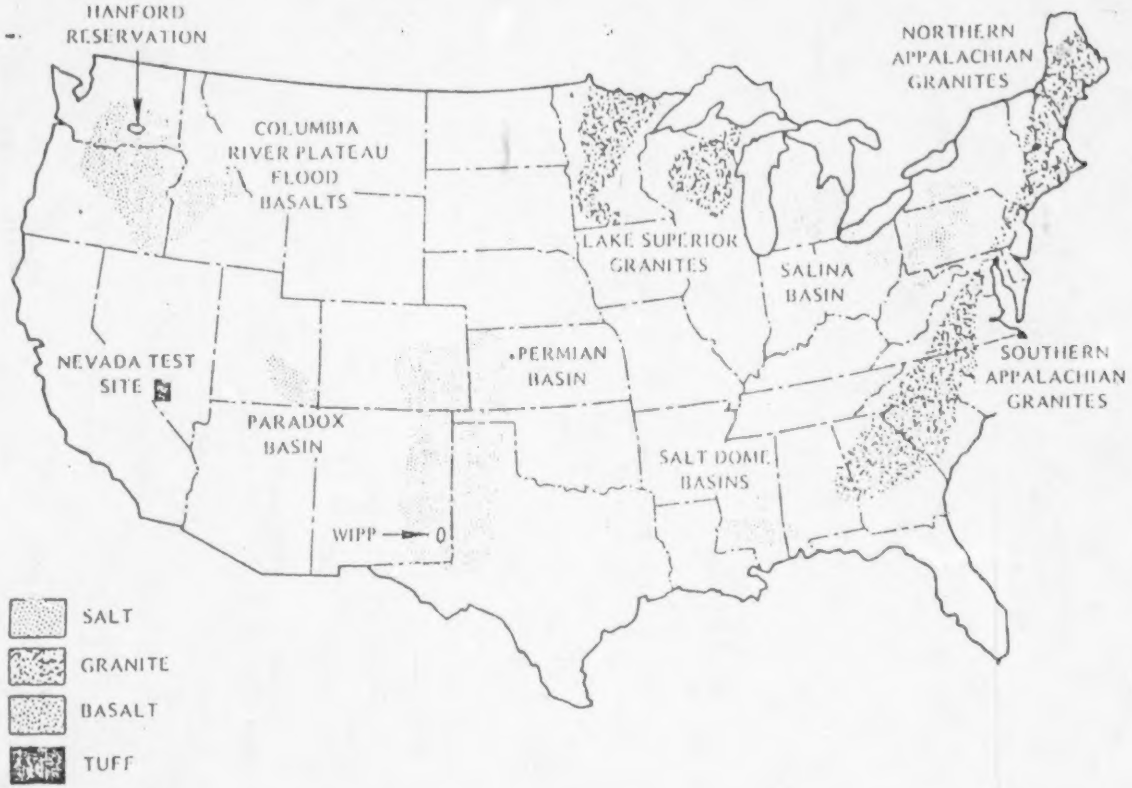
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COLUMBIA RIVER PLATEAU FLOOD BASALTS
NEVADA TEST SITE
PARADOX BASIN
WIPP
PERMIAN BASIN
LAKE SUPERIOR GRANITES
SALINA BASIN
SALT DOME BASINS
NORTHERN APPALACHIAN GRANITES
SOUTHERN APPALACHIAN GRANITES
SALT
GRANITE
BASALT
TUFF

REGIONS AND AREAS WHICH HAVE BEEN CONSIDERED FOR TERMINAL STORAGE OF RADIOACTICE WASTE

Testimony By William W. Hambleton Before House of Representatives Subcommittee on Energy Research and Production, The Honorable Marilyn L. Bouquard, Chairperson, regarding H.R. 1909, June 17, 1981

Madam Chairperson, Mr. Winn, and Members of the Subcommittee on Energy Research and Production:

My name is William W. Hambleton. I am State Geologist of Kansas, and Director of the Kansas Geological Survey, a Division of The University of Kansas, where I also serve as Professor of Geology. I have been associated with high-level waste programs since 1965 when the Atomic Energy Commission became interested in Lyons, Kansas as a potential repository site. I have served briefly on a National Academy of Science Subcommittee on Disposal of Waste in Salt; and I am Chairman of the State Geologists Technical Review Group, which beginning in 1976, served in an advisory capacity to the Energy Research and Development Administration, and continues with the Department of Energy. I served on the Review Committee to the Interagency Review Group in the Executive Office of the President under Dr. Frank Press, served on the Committee on Nuclear Waste Management of the Congressional Office of Technology Assessment, and serve on the Geological Review Group to the Office of Nuclear Waste Isolation of Battelle Memorial Institute. I have reviewed work of Department of Energy contractors on Gulf Coast Salt domes, the Palo Duro and Dalhart Basins of Texas, the Paradox Basin of Utah, and the WIPP site in New Mexico. In all these capacities I have served as an unpaid consultant on the geological aspects of nuclear waste management in order to maintain an independent review stance, and to represent a State point of view.

On April 24, 1981, I presented a paper entitled Historical Perspectives on Radioactive Waste Management at a symposium of the University of Wisconsin. A copy of this paper has been furnished to Mr. Ralph Stein for entry into your Subcommittee record, if you so wish. The effort to produce this historical perspective was more time consuming than I had contemplated, for such a review had not been undertaken previously. Although fascinating in its detail, the review does emphasize the lack of consistent national policy and direction since the beginning of the high-level waste disposal program in 1954. Thus, I compliment this Subcommittee for its efforts to provide a much needed sense of direction to the high-level waste program.

I appear as neither a proponent or opponent of H.R. 1909, but at Subcommittee staff request to make comments that may be helpful to the Subcommittee.

I suggest that the proposed research and development facilities are badly needed. Project Salt Vault at Lyons, Kansas originally was such a site. Its importance is demonstrated by the fact that data from the Lyons site regarding rock mechanics, thermal flux, and radiation flux are being extrapolated to sites as far away as the Gulf Coast because of the absence of better data.

Lyons was and is unacceptable as a disposal site because of problems of regional hydrology. The site simply offered too many possibilities for the entrance of groundwater, still the most likely avenue for radionuclides to reach the biosphere. Salt dissolution; the mobilization, transport and fixation of radionuclides in natural systems; and fracture permeability remain large unsolved geological problems for siting of high-level nuclear waste. Additionally, Lyons demonstrated the importance of rock heterogeneity. That is to say, rocks rarely are homogeneous, and change from place to place.

H.R. 1909, requiring identification of at least two geographically distributed demonstration facility sites in different geologic media bears a remarkable similarity to the rules and regulations of Nuclear Regulatory Commission 10 CFR 60, which require three sites, in at least two rock types, one of which shall not be salt; and to the statements by Colin Heath on March 17, 1981 at the meeting of the Atomic Industrial Forum in Los Angeles, where he called for development of shafts at three sites.

I have the following specific concerns about H.R. 1909. They are as follows:

1. H.R. 1909 stresses development only of engineering expertise, data, and information. In view of my afore going statements about rock mechanics, regional hydrology, need for studies of fracture permeability, and the like, these research and development sites also should include geologic investigations.

2. H.R. 1909 calls for emplacement of 40 canisters of vitrified waste from reprocessing irradiated reactor fuel in each of the two sites by 1985 and 1987 respectively. I inquire of the Subcommittee about the source of the reprocessing irradiated reactor fuel. To the best of my knowledge, no reprocessing facility is active, and the only available commercial reprocessing fuel is at West Valley, New York. I suggest that spent fuel rods could be included for use in a research and development facility.

3. I am skeptical about the time requirement of 180 days for identification of two sites. For example, extensive studies have been undertaken in the Palo Duro Basin of the Texas Panhandle. At this time, I know of no factors that would rule against the Palo Duro Basin as a potential region for waste disposal. However, the Palo Duro Basin region is very large, and I doubt that a specific site could be selected with care in six months. I suggest respectfully to this Subcommittee that the operational dates of 1985 and 1987 be retained, but that the Department of Energy be allowed to set its own timetable for site identification.

4. Although I am well aware of the political considerations involved in the requirement of H.R. 1909 that no research and development facility shall be converted, expanded into, or utilized as a permanent facility, I urge upon the Subcommittee the view that appropriate high-level waste disposal sites are difficult to find for any purpose and should not be abandoned carelessly. I emphasize again that rocks are heterogeneous, and that the geological conditions at one place may change markedly to another place within a given region. It seems prudent to me to retain the option for further developing a research and development site for a permanent repository if the characteristics of the site meet all requirements for a safe repository. I note again that disposal sites are difficult to find.

5. H.R. 1909 calls for consultation and coordination with state officials. Unfortunately, the specifics of this consultation and coordination process are not identified. In view of the extensive state legislation prohibiting storage and transportation of high-level waste, I wonder how this process of consultation and coordination with state officials will be implemented.

Mrs. **Bouquard**. Thank you very much, Dr. Hambleton, for your testimony.

Our next witness is Dr. Linn Draper who is vice president of nuclear technology, Gulf States Utilities Co.

Dr. Draper, you may proceed with your testimony. We do have your written testimony before us. And without objection, that will be included in the record. You may summarize or read your remarks.

Proceed as you wish.

[The biographical sketches of Dr. Draper and Dr. Lieberman follow:]

Biographical Sketch

E. Linn Draper, Jr.

Dr. Draper is Vice President - Nuclear Technology - River Bend Nuclear Group for Gulf States Utilities Company where he has also served as Technical Assistant to the Chairman of the Board. Prior to February, 1979, he was an associate professor in the College of Engineering at the University of Texas at Austin. While at the University of Texas, he was the Director of the Nuclear Engineering Program from 1971-79. Dr. Draper has served as a consultant to over thirty electric utility companies, several federal and state agencies, and a number of industrial concerns. He has presented testimony on nuclear power in ten states including Texas, Louisiana, New York, and California, as well as before committees of the U. S. Congress.

Dr. Draper is the author or coauthor of more than sixty technical publications and the editor of two books. He has served on the National Academy of Sciences Committee on Radioactive Waste Management and is currently a member of the Nuclear Committee of the Texas Energy Advisory Council.

He received his B.A. in 1964 and B.S. in Chemical Engineering in 1965 from Rice University and Ph.D. in Nuclear Engineering from Cornell University in 1970. His fields of specialization are nuclear waste management and public understanding of nuclear energy.

Biographical Sketch

Joseph A. Lieberman

Dr. Lieberman received the Bachelor of Engineering Degree in 1938 from the Johns Hopkins University and the Doctorate of Engineering in 1941 from the same institution. After military service he was employed by the U.S. Atomic Energy Commission where between 1948 and 1968 he was successively Sanitary Engineer; Chief, Environmental and Sanitary Engineering Branch and Assistant Director of Reactor Development for Nuclear Safety. Subsequently he held the positions of Assistant Administrator for Research and Technology of the Environmental Health Service in HEW, Deputy Assistant Administrator for Radiation Programs in EPA, and Senior Specialist in Energy and Environment in the Congressional Research Service. After leaving Government service he was employed by the General Electric Co. as Manager, Environmental Analysis in the Center for Energy Systems.

Since 1976 he has been associated with Nuclear Safety Associates, Inc., a private consulting firm in Bethesda, Md.

TESTIMONY OF E. LINN DRAPER, JR., VICE PRESIDENT, NUCLEAR TECHNOLOGY, GULF STATES UTILITIES CO., BEAUMONT, TEX., ACCOMPANIED BY JOSEPH A. LIEBERMAN, NUCLEAR SAFETY ASSOCIATES, INC.

Dr. **Draper**. Madam Chairman and members of the subcommittee: My name is E. Linn Draper, Jr. I am pleased to have the opportunity to appear before you today to testify on H.R. 1909 on behalf of the Utility Nuclear Waste Management Group, Edison Electric Institute and the American Nuclear Energy Council.

Accompanying me today is Dr. Joseph A. Lieberman of Nuclear Safety Associates, Inc. Nuclear Safety Associates has served as a consultant to the Utility Nuclear Waste Management Group in a number of areas, including high-level radioactive waste management.

Also here today is Mr. Russell E. L. Stanford, program manager of the utility group; and Mr. Edward M. Davis, vice president for technical matters for the American Nuclear Energy Council.

As you noted, I have prepared a complete statement which has been provided to members of the subcommittee and request that it be made a part of the record of the hearing.

For the convenience of the members, however, I would like to take just a short time to emphasize what I believe are the important points contained in the full statement.

The Federal Government program for managing high-level waste and spent nuclear fuel in the past has amounted basically to a research-oriented program with a large number of parameters related to high-level waste disposal rather than a project-oriented determined effort to place a radioactive waste repository in operation in a timely fashion.

Hundreds of millions of dollars have been spent by the Department of Energy on a seemingly endless array of studies. However, up to now, there has been little indication that an expeditious choice was being made from among the wide variety of waste forms, canisters, geologic media, and so on, and that the establishment of repositories was being pursued in a direct manner.

In fact, while waste management knowledge and technology have advanced, past programs have resulted in a retreat from target dates for an operating repository such that over the years, the time for the establishment of a repository has increased.

Against this background, current public concern over high-level waste disposal is understandable. Certainly, there is no reason for concern over the safety of continued interim storage of spent fuel and high-level waste from existing and future commercial reactor operations. No physical harm has occurred nor is there any reason to expect it.

However, there is a need for demonstration of the fact that waste disposal can be accomplished. We believe that public concerns could be greatly alleviated by the completion of an appropriate research, development and demonstration project.

In particular, H.R. 1909 provides one good mechanism for making the transition from a "steady-everything" mode to a project-oriented mode. In addition to the highly valuable public perception and acceptance purposes that would be served by the technology demonstration facilities provided for in the bill, important site-specific research and development information could be obtained.

Further, by shortening the overall schedule for full-scale repository development, the program provided in H.R. 1909 should result in cumulative cost advantages.

At the same time, however, it is vital to the purposes of the bill that the Department of Energy fully integrate near-term demonstration activities into its overall waste disposal program. In particular, nothing should be done which would further delay the establishment of a full-scale licensed repository.

While research, development and technology demonstration are important, they are only a part of the path leading to the goal of ultimate waste disposal. Accordingly, they should not be pursued in such a way as to impede the basic effort to achieve a working solution to the waste disposal problem.

Second, it is important that a site which is the location of a facility provided for in H.R. 1909 not thereby be automatically excluded as the possible location of a full-scale repository. To preclude any confusion, the language of the bill should be revised to make it clearer that it is not intended that an entire site be eliminated from potential use as the location of a permanent, full-scale repository simply because of the presence of a demonstration facility.

Finally, we would like to see the demonstration aspects of H.R. 1909 more forcefully highlighted. We firmly believe that an early, highly publicized demonstration of high-level waste disposal is in the national interest. The immediate need is for an early demonstration that the necessary technology exists, and that there are currently available solutions to the problem of high-level waste disposal. The longer the Federal Government procrastinates, the more public confidence will be eroded.

We remain ready to assist the subcommittee in any way that we can. Dr. Lieberman and I would be pleased to answer any questions that members might have.

[The prepared statement of Dr. Draper follows:]

Statement of Dr. E. Linn Draper, Jr.
Vice President - Nuclear Technology -
River Bend Nuclear Group
for
Gulf States Utilities Company
on Behalf of the
Utility Nuclear Waste Management Group,
Edison Electric Institute & American Nuclear Energy Council
on H.R. 1909
Before the Subcommittee on Energy Research and Production
Committee on Science and Technology
U. S. House of Representatives
June 17, 1981

Madam Chairman and Members of the Subcommittee: I am pleased to have the opportunity to appear before you today and testify on H.R. 1909, the "Nuclear Waste Research, Development, and Demonstration Act of 1981."

My name is E. Linn Draper, Jr. I am Vice President - Nuclear Technology - River Bend Nuclear Group for the Gulf States Utilities Company, Chairman of the Utility Nuclear Waste Management Group (UNWMG), and a member of the Edison Electric Institute's Nuclear Power Executive Advisory Committee. As I believe most of you are aware, the UNWMG is a group of 39 publicly-owned and investor-owned electric utilities*/ which is concerned with matters relevant to nuclear waste management. I am also appearing on behalf of the Edison Electric Institute (EEI), the association of the nation's investor-owned utilities whose members generate more than 77% of all the electricity in the country and serve 65 million ultimate customers in the United States; and on behalf of the American Nuclear Energy Council (ANEC), which represents more than 100 organizations having an interest in nuclear power, including private, public and cooperatively owned utilities, manufacturers, architect-engineers, and various firms in the nuclear fuel cycle.

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*/ Alabama Power Company; Arizona Public Service Company; Baltimore Gas & Electric Company; Boston Edison Company; Carolina Power & Light Company; The Cleveland Electric Illuminating Company; Commonwealth Edison; Consolidated Edison Company of New York; The Detroit Edison Company; Duke Power Company; Duquesne Light Company; Florida Power & Light Company; Florida Power Corporation; Georgia Power Company; Gulf States Utilities Company; Houston Lighting & Power Company; Illinois Power Company; Iowa Electric Light & Power Company; Long Island Lighting Company; Los Angeles Department of Water and Power; Middle South Utilities; Nebraska Public Power District; Niagara Mohawk Power Corporation; Northeast Utilities; Northern States Power Company; Pennsylvania Power & Light Company; Philadelphia Electric Company; Portland General Electric Co.; Power Authority of the State of New York; Public Service Electric & Gas Company; Sacramento Municipal Utility District; Southern California Edison Company; SNUPPS; Texas Utilities Company; Toledo Edison Company; Virginia Electric & Power Company; Wisconsin Electric Power Company; Wisconsin Public Service Corporation; and Yankee Atomic Electric Company.

Accompanying me today is Dr. Joseph A. Lieberman of Nuclear Safety Associates, Inc. Nuclear Safety Associates has served as a consultant to the UNWMG in a number of areas, including high-level radioactive waste management. Also here today is Mr. Russell E. L. Stanford, UNWMG Program Manager, and Mr. Edward M. Davis, Vice President, Technical, for ANEC.

As you are aware, testimony on H.R. 1909 was presented before the Subcommittee last February by Mr. Snipes of Duke Power Company, who is the Chairman of the High-Level Waste Working Group of the UNWMG, on behalf of the UNWMG, Edison Electric Institute, and American Nuclear Energy Council. At that time, Mr. Snipes discussed some of the history of

Federal nuclear waste management and details of the bill. I will not repeat his testimony today. However, I would like to emphasize some of the more important points, and add a few additional thoughts.

The Federal government's program for managing high-level waste and spent nuclear fuel over the past four years has amounted, basically, to an effort to study an almost unlimited number of parameters related to high-level waste disposal, rather than to placing a waste repository into operation in a timely fashion. Literally hundreds of millions of dollars have been spent by DOE on a seemingly endless array of studies on different components and other aspects of a repository system. Further, although the DOE program has involved the efforts of a battalion of scientists and engineers, there has been little indication in the past that an expeditious choice is to be made from among the wide variety of waste forms, canisters, geologic media and so on, and that the establishment of geologic repositories will be actively pursued in a direct fashion and timely manner. In fact, past programs have resulted in a retreat from target dates for an operating repository such that, over the years, the time to the establishment of such a repository has increased. Thus, while waste management knowledge and technology have advanced, providing an ever greater degree of confidence in the ability to dispose of high-level waste, there has been a loss of ground in the target dates for actual demonstration of the technology.

Against this backdrop, current public concern over high-level waste disposal is understandable. While it is true that no physical harm has been done and that -- from an environmental, health and safety standpoint -- there is no reason to be concerned with the continued interim storage of spent fuel and high-level waste from existing and future commercial reactor operations, there is a need for field demonstration that waste disposal can be accomplished. As a result of more than 20 years of scientific studies, the basic technology is in hand. We believe that public concerns could be greatly alleviated by the completion of an appropriate research, development and demonstration project.

In particular, H.R. 1909 provides one good mechanism for making the transition from a "study-everything" mode to a project-oriented mode. In addition to the highly valuable public perception and acceptance purposes that would be served by the technology demonstration facilities provided by the bill, important site-specific research and development information would be obtained. Additional modeling and laboratory efforts cannot supplant the verification of data that will be provided by placing real radioactive species in actual geologic media. Further, by shortening the overall schedule for full-scale repository development, the program provided in H.R. 1909 should result in cost advantages. The research, development, and demonstration program provided by the bill should serve to facilitate completion of the DOE effort to establish a waste repository by requiring a choice from among a seemingly endless array of options that have been subjected to study and analysis. To enhance these favorable aspects of the bill, I would like to reemphasize certain specific recommendations which Mr. Snipes made in his testimony earlier this year.

First, it would be helpful if the language of the bill were to emphasize that -- while research, development and technology demonstration are important -- they are only a part of the path leading to the ultimate goal of establishing full-scale repositories. It is vital that DOE fully integrate these near-term demonstration activities into its overall waste disposal program. Above all, nothing should be done which would further delay the establishment of a full-scale licensed repository. We also believe that section 2 might be clarified further to avoid any ambiguity as to Congressional views concerning the existence of disposal technology. UNWMG-EEI have taken the position -- as has DOE -- in the Nuclear Regulatory Commission's Waste Confidence Rulemaking that the technology currently exists for the safe disposal of high-level radioactive waste in geologic repositories. We also believe that this is the view expressed in H.R. 1909 which, in Section 2(b)2, refers confirmation of the existence of technological solutions to the problem of waste disposal. The language of the bill, however, could be modified to provide clarification.

In section 3 there is a definition of "'technology demonstration facility' and 'demonstration facility'." This definition should be changed to state more clearly that a site which is the location of such a facility is not thereby automatically excluded as the location of a full-scale repository. To preclude any possible confusion, the language should be revised to make it clear that a technology demonstration facility at a given site would not, in and of itself, eliminate the entire site from potential use as the location of a permanent, full-scale repository. In addition, and with reference to the same definition, we believe that the facilities provided for in H.R. 1909 should not be limited solely to the receipt of solidified high-level waste. We appreciate and enthusiastically share what we view as the subcommittee's expression of support for reprocessing, and the position that any research, development and demonstration facility should provide for the receipt of reprocessing waste. However, in view of unavoidable uncertainties and the need for flexibility, we believe that demonstration facilities should be designed for and receive both high-level reprocessing waste and spent fuel.

In concluding, I would like to add one final thought. We would like to see the demonstration aspects of H.R. 1909 more forcefully highlighted. We believe that an early, highly publicized demonstration of high-level waste disposal is in the national interest. The technology exists today to design and build a demonstration facility. Such a facility could be planned and constructed now, on a conservative basis, so as to fully envelop any design uncertainties. The immediate need is for early demonstration that the necessary technology exists, and that there are solutions to the problem of high-level waste disposal. This, we believe, would go a long way toward alleviating the public concern in this area, which is based on a feeling that inaction stems from an inability to act. The longer the Federal government procrastinates, the more public confidence will be eroded.

We remain ready to assist the subcommittee in any way that we can and would be pleased to answer any questions.

Mrs. **Bouquard**. Thank you very much, Dr. Draper.

Our next witness is Mr. David Berick from the Environmental Policy Center.

We also have your statement. It will be included in the record. You may summarize or proceed as you wish.

TESTIMONY OF DAVID BERICK, ENVIRONMENTAL POLICY CENTER, WASHINGTON, D.C.

Mr. **Berick**. Thank you, Madam Chairman. I am David Berick from the Environmental Policy Center. Because of the intense interest among the environmental community on the nuclear waste issue, we have prepared a joint statement. And the statement that I submitted to the committee represents the views of not only the Environmental Policy Center, but Congress Watch, Sierra Club, Union of Concerned Scientists, Environmental Action, and Friends of the Earth.

Madam Chairman, I think our fundamental concern with H.R. 1909 is that it is going after the wrong nuclear waste issue. It is going after the nuclear waste issue as it affects nuclear development or the construction of new nuclear powerplants as opposed to the nuclear waste problem of how we fully solve the nuclear waste disposal difficulties that have clearly beset the nuclear industry as well as the defense program as well as those communities that have been selected or singled out by the Department of Energy for waste disposal.

We have several problems with H.R. 1909. We believe that it fails to address the fundamental issue that has arisen in the nuclear waste area which is the selection of technically defensible sites. And this is a serious problem, not only because of the technical requirements of waste disposal, but also because it is the site itself that is arousing the greatest amount of furor over the Department of Energy's waste programs.

Unfortunately, we believe that 1909 will derail the Department of Energy's nuclear waste efforts rather than accelerate them because it will divert resources and attention from necessary research and the site selection programs.

We fear that the bill will undermine and delay DOE's efforts to identify technically defensible repository sites through its relegation of site selection to a secondary role in its emphasis on engineered barriers.

We believe DOE's credibility and public confidence in the Federal nuclear waste program will be undermined by the avoidance of those fundamental issues of the technical and political concerns over site selection.

And lastly, we believe that DOE's timetable for the development and licensing of full-scale geological repositories will be jeopardized because the bill would establish artificial and inadequate performance objectives and site requirements for DOE's waste programs rather than requiring DOE to meet the standards promulgated by the Nuclear Regulatory Commission.

As the committee is no doubt aware, the Earth Sciences Technology Plan, other DOE reports, articles by independent scientists contain extensive discussions of unresolved scientific issues. These problems will not disappear. They really must be addressed. And the diversion of attention and funds from those kinds of projects as required in this bill, which requires a 60-day reorientation of the entire DOE waste research program toward the construction of these demonstration projects, we believe, will simply be counterproductive. And that the consensus of this decision to move toward demonstration repositories will be multiplied in years to come when these projects move into the construction stage and require ever larger shares of the DOE waste budget.

As I said before, we continue to believe that the foremost issue in nuclear waste disposal is the technical and political issues of the development of sites. DOE has been heavily, and we believe, rightly criticized over the years for failing to develop an orderly screening and selection process for sites. We are left with sites like the Nevada Test Site and Hanford Reservation, which are on the list primarily because they are in DOE reservations. They are not the result of an overall site screening program.

DOE today has not put into effect and implemented a comprehensive set of site selection criteria. And as a result, we have people all over the country who really have very serious reservations about what happens when DOE moves into their backyard because there isn't any set of ground rules as to which sites qualify and which sites do not qualify.

The proposal in the bill that there be mandatory selection of demonstration sites within 180 days of enactment is a sure way to destroy what little credibility DOE has in this area and ignores the necessity for DOE to develop and refine its site selection process.

We also believe, that if these kinds of facilities are to be developed, it is essential that they be based upon a comprehensive DOE selection process.

As has already been mentioned by members of the panel, there seems to be little value to us, too, in picking high-level waste sites that are not considered suitable for actual repositories either for technical reasons, or for the obvious political credibility reasons.

Likewise, we believe that site characterization should be carried out with the concurrence of the Nuclear Regulatory Commission. Again, we see little that can be accomplished by investigating sites and demonstrating suitability of waste technologies that will not pass muster with the NRC.

The bill's emphasis on engineered barriers and requirement that repository performance be limited to the length of time that the waste would decay to uranium ore standard is an issue that I have raised before in the committee. It is a very ambiguous standard, and it is a standard that does not protect the public health and safety. As EPA has estimated, the potential risk from uranium ore bodies in the United States is roughly by their calculations 100 to 1,000 cancers per year from generic uranium ore bodies.

Similarly, the bill's requirements that we go ahead with the design and construction of waste solidification facilities is also highly questionable. The problem is not a lack of waste solidification facilities; the problem is we don't have a waste form that will pass the NRC technical requirements.

And we also note in passing the committee's cutback in the West Valley solidification program which, as we read the bill, would be absolutely necessary to the requirements of development of vitrified waste forms.

Finally, the issue that we think needs to be addressed in the bill is the entire issue of State participation. There is too much water over the proverbial dam to fail to get to this issue head on. As we have seen with the Waste Isolation Pilot Project in New Mexico, excuses that a project is simply an R. & D. project or a project is a defense project does nothing to deter the concerns of the people who live within the State that that facility is located, or even adjacent States, as to whether their concerns will be addressed and as to whether the Department of Energy, whether the Federal Government, is really doing its job. And I think at this point, it is important that the committee recognize that the House of Representatives as well as the Senate made enormous progress toward dealing with this really very contentious issue in the last Congress.

And they did move to a very close compromise on this entire issue. And we would really urge the committee to address head on this particular pressing issue.

Thank you.

[The prepared statement of Mr. Berick follows:]

TESTIMONY ON H.R. 1909

"NUCLEAR WASTE RESEARCH, DEVELOPMENT AND DEMONSTRATION ACT OF 1981"

before

SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
COMMITTEE ON SCIENCE AND TECHNOLOGY

by

DAVID BERICK

on behalf of

ENVIRONMENTAL POLICY CENTER
CONGRESS WATCH
ENVIRONMENTAL ACTION
SIERRA CLUB
UNION OF CONCERNED SCIENTISTS
FRIENDS OF THE EARTH

Thank you for the opportunity to testify on H.R. 1909, the Nuclear Waste Research, Development and Demonstration Act of 1981. This testimony represents the views of the Environmental Policy Center, Congress Watch, Sierra Club, Union of Concerned Scientists, Environmental Action and Friends of the Earth.

We have reviewed H.R. 1909 and the remarks accompanying its introduction in the Congressional Record of February 18, 1981. In our view, H.R. 1909 is based on a false premise that additional research on nuclear waste forms is unnecessary and that available technologies and disposal sites should be rushed into use in order to free nuclear power from its current "political morass."[1]

It is unfortunate that this legislation is aimed at addressing this political problem rather than at specific technical difficulties facing the Federal Government's nuclear waste management programs where there is more agreement among the various parties to the nuclear issue. H.R. 1909 fails to address the principal issue in nuclear waste disposal which is the need for technically defensible sites based upon geological selection criteria rather than the development of nuclear waste forms. Enactment of H.R. 1909 would, in our opinion:

* Derail DOE's nuclear waste efforts by diverting resources and attention from necesary research and site selection programs to costly and premature demonstration projects.
* Undermine and delay DOE's efforts to identify technically defensible repository sites through its relegation of site selection to a secondary role.
* Compromise DOE's credibility and lessen public confidence in the Federal nuclear waste program through its failure to address technical and political concerns over site selection and insistence upon the immediate selection

of existing sites.

- Jeopardize DOE's timetable for development and licensing of full-scale geologic repositories because it establishes artificial and inadequate performance objectives and site requirements for DOE's waste programs rather than requiring DOE to meet the standards promulgated by the Nuclear Regulatory Commission.

As indicated by the Environmental Policy Center during hearings before this committee in February, H.R. 1909 will not provide the hoped for direction to DOE's nuclear waste programs. It will simply derail existing programs by requiring the entire DOE waste effort to focus, within 60 days of enactment, on the construction of two demonstration facilities. This curtailment of on-going research is short-sighted and will result in longer delays in the future when DOE siting and design decisions are challenged by the public, their state and local officials and the Nuclear Regulatory Commission, as indeed they will be.

The Earth Sciences Technical Plan prepared by DOE and USGS, the joint DOE/Batelle report "Status of Technology for Isolating High-Level Radioactive Wastes in Geologic Repositories,"[2] filings before the NRC in its "waste confidence" rulemaking,[3] and articles by independent scientists, such as Dr. P.A. Witherspoon[4] who testified before this Committee in February, contain extensive discussions of unresolved scientific and technical issues in nuclear waste disposal. Surely the Committee is aware of these issues. They will not disappear regardless of the amount of rhetoric concerning the "seemingly endless series of studies, reviews, and evaluations of nuclear waste disposal."[5] Diversion of attention and funds from necessary research efforts in favor of demonstration projects will be counterproductive, and the consequences of doing so will be multiplied in the years to come when these projects move into the construction stage and require ever larger shares of the DOE waste budget.

H.R. 1909, in our view, completely fails to address the need for a comprehensive repository siting and development program from the standpoints of technical knowledge and public confidence. Despite the bill's attempt to minimize the role that siting plays in containing wastes in the proposed demonstration repositories, site selection is the foremost technical and political issue of the development of geologic waste repositories. The NRC's nuclear waste disposal regulations governing repositories clearly spell out not only the importance of the specific site as a primary containment mechanism for wastes, but the importance of how specific sites are evaluated or characterized.

DOE has been heavily and rightly criticized over the years for failing to develop an orderly screening and selection process for geologic repository sites. DOE's detailed selection efforts have been primarily limited to sites of convenience on DOE reservations such as the Nevada Test Site or the Hanford Reservation or to sites in salt formations such as WIPP. These sites were not chosen on the basis of geologic site selection criteria, and DOE has never fully implemented a comprehensive set of such criteria. As a result DOE has drawn fire from many quarters for discounting fundamental technical issues such as the ability of rock-types to "fix" radioactive wastes, a major draw-back of salt, or institutional issues such as human intrusion or resource conflicts, an issue at WIPP. H.R. 1909's mandatory selection of demonstration sites within 180 days of enactment is a sure way to destroy what little credibility DOE has in this area and ignores the necessity for DOE to develop and refine its site selection process. Rather than promoting a careful and technically defensible site selection process, the bill will simply force DOE to choose among existing and controversial sites.

The Committee should not accept the 180 day time line proposed in H.R. 1909 for the selection of sites. While site characterization activities can be carried out within the 1987 time frame proposed in the bill, sites should be chosen as part of DOE's overall repository site selection process rather than separately as proposed in H.R. 1909. What would be the purpose of emplacement of high-level waste at sites not considered suitable for actual repositories by DOE?

Site characterization activities should, of course, be carried out with the concurrence of the Nuclear Regulatory Commission. Again, what would be gained by investigating sites and demonstrating the suitability of waste technologies which will not pass muster with the NRC?

The bill's emphasis on the use of engineered barriers and the requirement that repository performance be limited to a period of time in which high-level waste would decay to a hazard comparable to uranium ore are also at odds with present DOE program objectives and NRC regulations. More importantly, they are inadequate to protect the public health and safety and environment. The uranium ore standard in the bill represents a completely ambiguous and unacceptable performance standard. Not only is there a vast range of uranium ore grades being exploited, but uranium ore in general constitutes a significant health hazard. USEPA has estimated a potential risk from a generic uranium ore body to the U.S. population of 100 to 1000 cancers per year.[6]

Clearly, the intent in using the uranium ore standard is to limit the required performance of repositories to a period of time which can be met by engineered barriers. This is an arbitrary standard and will not meet current regulatory requirements--a fact which will not be lost on potential host states. It is simply counterproductive to implement an entire demonstration program which will not conform to NRC repository regulations as far as either technical progress or public acceptance is concerned. Certainly, it would be more productive for DOE to demonstrate that it could meet or surpass NRC requirements developed in a public rulemaking.

Similarly, the bill's requirement that DOE design, construct, and operate waste solidification facilities is a hopelessly broad and open-ended authorization. The problem is not a lack of waste solidification facilities, but a lack of technological development of waste forms that meet NRC technical criteria for repository emplacement. Waste form development must proceed in coordination with NRC mandated repository site and design. We note in passing the Committee's cutback in the West Valley waste solidification program as evidence of the Committee's own ambivalence over the need to construct solification facilities.

H.R. 1909 also fails to address the range of long-recognized institutional problems facing the DOE waste effort beginning with the need to provide a direct role for state and local governments in DOE's nuclear waste decisions. The bill, contrary to assurances inserted in the Congressional Record, does not give states a "meaningful opportunity to influence any actions taken by the Secretary under this bill."[7] The bill limits state participation to a consultative role.

Unfortunately, there is too much water over the proverbial dam to even suggest that such a cursory treatment of the state role issue resolves this particular political dilemma. The pattern of state distrust and opposition to DOE waste projects is well established and each new move by the Federal Government is watched by states and local jurisdictions more carefully than before. H.R. 1909 merely avoids dealing with this problem under the theory that R&D projects will not be controversial. As we have seen with the WIPP project, explanations that a project is just for R&D, or just for defense, are no longer satisfactory excuses for circumventing full state participation and concurrence.

There are several legislative approaches to the establishment of a state role ranging from binding arbitration, as proposed in Representative Lundine's bill (H.R. 1993), to a federal override process as contained in the waste bill which passed the House at the end of the 96th Congress (H.R. 8378). We believe that the most comprehensive state role proposal is S. 95, introduced by Senators Percy and Glenn, which provides for a negotiated memorandum of understanding, specific decision point during the siting and development of the repository, and a two-house override should a state formally object to a DOE decision to construct a repository.

Public confidence in DOE's nuclear waste program is extremely low. Current DOE waste activities around the country, especially the WIPP project in New Mexico and site exploration in Utah are only exacerbating the situation. DOE actions in New Mexico have resulted in a suit filed May 14th by the New Mexico Attorney General to stop the project. In addition, the Utah Legislature passed a legislative ban on waste disposal in the State in February.

H.R. 1909's concentration on the political problems nuclear waste poses for nuclear powerplant development will only exacerbate the difficulties in solving the nuclear waste problem. The construction of demonstration repositories under the ground rules in the bill, such as circumvention of a meaningful state role or avoidance of NRC regulations, fall far short of the performance necessary to meet the political objectives of the bill or technical progress.

It is essential, in our opinion, that federal programs for nuclear waste management not revert to the uncoordinated series of research projects which have characterized this effort in the past. Already we are seeing a complete separation of defense and commercial nuclear waste programs which will result in unnecessary duplication and competition for budget resources and repository sites. The commercial program continues to fall victim to the public relations problems engulfing the defense waste project at WIPP. The Committee must look beyond the narrow "demonstration" emphasis of H.R. 1909 and begin to address the fundamental technical and institutional issues surrounding radioactive waste disposal.

We make the following recommendations concerning H.R. 1909:

- The Committee should require a comprehensive federal nuclear waste management plan similar to that under development by DOE under the previous administration or to that proposed in Representative Lundine's bill. The demonstration project management plan proposed in Section 5 should be expanded into a genuine research plan based on the Earth Sciences Technical Plan and Site Screening and Evaluation Plan now under revision at DOE.
- The Committee should widen the field of possible waste forms under development to include spent fuel in order to benefit from the significant amount of work done in this area and to preserve this option should utilities choose to exercise it or should commercial reprocessing be indefinitely postponed. Spent fuel disposal must also be pursued for use in those cases, such as damaged or failed fuel, where reprocessing is not practical.
- Engineered barriers should not become the primary emphasis of the DOE research program as proposed in H.R. 1909 since they are inadequate to meet NRC regulatory requirements or to protect the public health and safety.
- Potential waste disposal sites should be chosen on the basis of a comprehensive site selection program including detailed suitability criteria

rather than a mandatory 180 day selection period such as proposed in the bill.

- Site characterization activities should be carried out with the concurrence of the NRC.
- The Committee should drop the state "consult and coordinate" approach contained in the bill and establish a formal state participation process including a memorandum of understanding and state concurrence procedures.

Footnotes:

1) Congressional Record, February 18, 1981, Extensions of Remarks, Hon. Marilyn Lloyd Bouquard, p. E 512

2) DOE/TIC 11207, "Status of Technology for Isolating High-Level Radioactive Wastes in Geologic Repositories", October, 1980

3) NRC Rulemaking, 44 Fed. Reg. 61372, "Waste Confidence Rulemaking", PR-50,51

4) Witherspoon, Dr. P.A., "Geologic Storage of Radioactive Waste: Field Studies in Sweden", Science, Vol. 211, 27 February 1981, p. 894

5) Congressional Record, February 18, 1981, Extensions of Remarks, Hon. Barry M. Goldwater, p. E 509

6) EPA 520/3-80-009, "Population Risk from Uranium Ore Bodies", October, 1980

Mrs. BOUQUARD. Thank you very much, Mr. Berick.

Our next witness is Mr. Holmes Brown of the National Governors' Association, which is presenting the statement on behalf of John Evans, chairman of the Subcommittee on Nuclear Power.

We have your testimony. It will be included in the record. You may proceed with your testimony as you wish or you may summarize.

Please proceed, Mr. Brown.

[The biographical sketch of Mr. Brown follows:]

Biography

Holmes Brown currently serves as the Associate Staff Director of the Committee on Energy and Environment of the National Governors' Association. His specific responsibilities include staffing the Subcommittee on Nuclear Power and the Subcommittee on the Environment. He also assisted the National Governors' Association Task Force on Low-Level Radioactive Waste Management in preparing the Task Force report, Low-Level Waste: A Program For Action which was endorsed by the NGA in August, 1980. This report provided the basis for many of the provisions of the Low-Level Radioactive Waste Policy Act adopted by Congress in December of 1980. Previous to his employment with the National Governors' Association, Mr. Brown served for three and a half years on the staff of Senator Floyd Haskell of Colorado. His responsibilities included foreign and military policy and nuclear energy.

Mr. Brown was educated at Hamilton College and Oberlin College where he received a Bachelor of Arts degree in 1964. He attended graduate school at the University of Virginia in English Literature. He is the co-author of two books on Indochina.

TESTIMONY OF HOLMES BROWN, NATIONAL GOVERNORS' ASSOCIATION, WASHINGTON, D.C.

Mr. BROWN. Madam Chairman, members of the committee, my name is Holmes Brown. I am associate director of the energy and environmental program of the National Governors' Association. I have specific responsibility for staffing the subcommittees on nuclear power and other environmental committees. I am testifying today on behalf of Gov. John Evans of Idaho who is the chairman of the National Governors' Association's subcommittee on nuclear power.

Governor Evans is also a member of the State planning council.

I very much appreciate the opportunity to submit a statement to you today. The issue of nuclear waste is of critical importance to the Governors. It is a problem that has grown in scope and magnitude since America and the world entered the nuclear era 35 years ago.

As we increase our reliance on nuclear power, we are increasingly faced with a public mandate to resolve the waste issue. We have unfortunately reaped the benefits of the atom without a public policy for resolving the dilemma of its wastes.

We have not taken positions on many of the technical aspects involved in nuclear waste. We feel the most critical aspect of waste disposal from the State's point of view is the form and extent of State participation.

The National Governors' Association has long maintained that the States must play a primary role in decisions affecting nuclear waste facilities. We have used the terms "consultation and concurrence" and "cooperative federalism" to describe how that should happen. Our position is based on the principle that no State may reasonably impede the national interest, but that likewise federalism makes the States all equal partners in that interest.

The consultation and coordination provisions include in this bill as currently drafted fall short of the meaningful participation that we had envisioned. The process that we support instead will allow State and local officials to participate collectively and individually with all involved agencies in the development of all radioactive waste management programs and policies.

In the nuclear waste field, consultation and concurrence has been defined as involving States from the very beginning of a project through the sharing of information and the joint review of decisions. In a few limited instances, if a State disagrees with Federal proposal, the State may appeal to higher authority.

States, through the National Governors' Association and the State planning council, have proposed an appeal to Congress at the point where DOE proposes final construction plans. Last year, Congress accepted the State proposals with both the House and the Senate adopting bills which contained consultation and concurrence provisions permitting States to appeal to Congress. If a State is able to persuade Congress of the validity of its objections, the DOE would be required to correct the problems.

States feel this is a reasonable, workable solution which equitably balances States and Federal interests. We were gratified last year when Congress included consultation and concurrence as an essential element of the national high-level waste management program.

Let us turn now to the legislation at hand, H.R. 1909, the Nuclear Waste Resarch, Development, and Demonstration Act of 1981. Subcommittee members may question why the National Governors' Association would suggest that State/Federal relations involving a demonstration repository be governed by a process more structured than that called for in section 4(d).

Furthermore, proponents of a demonstration repository may feel that increased State involvement may delay the timetable for completion of the demonstration facilities. Given past experience with DOE's accelerated construction schedule called for in this bill, NGA recommends an augmented role for State officials similar to that developed in legislation last year.

A second reason that the Governors' Association would recommend an increased State role is that the demonstration project has no upper limit. There is a 40-ton minimum, but no upper ceiling. DOE officials have recently indicated the demonstration facility should be expanded to at least several hundred canisters.

Third, while the bill alludes to a termination date of 2005, that limit could be extended at the discretion of the Secretary of Energy.

Fourth, the legislation states that no demonstration facility shall be converted into a permanent repository. Statements by DOE officials indicate that their current preference is to expand a demonstration facility into a permanent repository if no technical disqualifications are encountered in construction. A demonstration project should not simply be a method of circumventing the regulatory and public participation provisions now in place.

To allay some State concerns, NGA would suggest that section 4(d) be changed to incorporate the concept of consultation and concurrence. The procedure developed last year, which was endorsed by the National Governors' Association, the State planning council, and majorities in both the House and the Senate, called for a State appeal to Congress at the construction stage of development. This appeal, governed by rules of expedited procedures in both the House and Senate, would add at most several months to the schedule called for in this bill if Congress approved the project. The additional time required is a small price to pay for satisfying many of the concerns of the States.

The National Governors' Association is anxious to facilitate adoption of waste disposal legislation this session. We are convinced that the recommendations we are suggesting will strengthen the partnership that is essential to a successful program.

Thank you.

[The prepared statement of Mr. Brown follows:]

PREPARED TESTIMONY OF HOLMES BROWN, NATIONAL GOVERNORS' ASSOCIATION

Madam Chairman, Members of the Committee: As Governor of Idaho and as chairman of the National Governors' Association's Subcommittee on Nuclear Power, I very much appreciate the opportunity to submit a statement to you today. The issue of nuclear waste is of critical importance to me, the residents of my state and my fellow Governors. It is a problem that has grown in scope and magnitude since America and the world entered the nuclear era 35 years ago. As we increase our reliance on nuclear power, we are increasingly faced with a public mandate to resolve the waste issue. We have unfortunately reaped the benefits of the atom without a public policy for resolving the dilemma of its wastes.

The National Governors' Association has long maintained that the states must play a primary role in decisions affecting nuclear waste facilities. We have used the terms "consultation and concurrence" and "cooperative federalism" to describe how that should happen. Our position is based on the principle that no state may reasonably impede the national interest, but that likewise federalism makes the states all equal partners in that interest. The consultation and coordination provisions included in this bill as currently drafted fall short of the meaningful participation that we had envisioned. The process that we support instead will allow state and local officials to participate collectively and individually with all involved agencies in the development of all radioactive waste management programs and policies.

In the nuclear waste field, consultation and concurrence has been defined as involving states from the very beginning of a project through the sharing of information and the joint review of decisions. In a few limited instances if a state disagrees with a federal proposal, the state may appeal to higher authority. States, through the National Governors' Association and the State Planning Council, have proposed an appeal to Congress at the point where DOE proposes final construction plans. Last year Congress accepted the state proposals, with both the House and the Senate adopting bills which contained consultation and concurrence provisions permitting states to appeal to Congress. If a state is able to persuade Congress of the validity of its objections, the DOE would be required to correct the problem. States feel this is a reasonable, workable solution which equitably balances states and federal interests. We were gratified last year when Congress included consultation and concurrence as an essential element of the national high level waste management program.

Let us turn now to the legislation at hand, H.R. 1909, the "Nuclear Waste Research, Development, and Demonstration Act of 1981." Subcommittee members may question why the National Governors' Association would suggest that state/federal relations involving a demonstration repository be governed by a process more structured than that called for in Section 4(d). Furthermore, proponents of a demonstration repository may feel that increased state involvement may delay the time table for completion of the demonstration facilities.

From a state perspective, the legislation as written requires clarification and a significant expansion of the state participation provisions. The following areas are of particular concern to the states.

First, the requirement that the Secretary of Energy "consult and coordinate with State officials" is undefined. In contrast to the precisely delineated, state-endorsed concept of "consultation and concurrence", Section 4(d) appears inadequate. Given past experiences with DOE and the accelerated construction schedule called for in this bill, the National Governors' Association recommends an augmented role for state officials similar to that developed in legislation last year.

Secondly, the size of the demonstration project has no upper limit. While a minimum of forty full-size canisters of vitrified waste would be emplaced, the ultimate scale of the project is defined only by what DOE finds appropriate for the purposes of the project. Department of Energy officials have recently indicated that a demonstration facility should be expended to at least several hundred canisters. Without a statutorily defined ceiling, even this figure could be raised. State officials find this degree of uncertainty unsettling and would favor a statutorily-defined size limitation.

Thirdly, while the bill alludes to a termination date of 2005, that limit could be extended at the discretion of the Secretary of Energy.

Fourthly, the legislation states that no demonstration facility shall be converted into a permanent repository. Statements by DOE officials indicate that their current preference is to expand a demonstration facility into a permanent repository if not technical disqualifications are encountered in construction. A demonstration project should not simply be a method of circumventing the regulatory and public participation provisions now in place.

To allay some state concerns, NGA would suggest that Section 4(d) be changed to incorporate the concept of consultation and concurrence. The procedure developed last year—which was endorsed by the National Governors' Association, the State Planning Council, and majorities in both the House and the Senate—called for a state appeal to Congress at the construction stage of development. This appeal, governed by rules of expedited procedure in both the House and Senate, would add at most several months to the schedule called for in this bill if Congress approved the project. The additional time required is a small price to pay for satisfying many of the concerns of the states.

The National Governors' Association is anxious to facilitate adoption of waste disposal legislation this session. We are convinced that the recommendations we are suggesting will strengthen the partnership that is essential to a successful program. Thank you.

Mrs. BOUQUARD. Thank you very much, Mr. Brown.

According to the rules of procedure adopted by this committee, the members of the subcommittee will be recognized to ask questions of the witnesses in the order in which they came to today's hearing. The order will be as follows: myself, Mr. Winn, Mr. Goldwater, Mr. Ottinger, Mr. Lujan, Mr. Lundine, Mr. Hollenbeck, and Mr. Wolpe.

Before I begin my questions, I would like to ask unanimous consent to insert a statement in the appendix to this record, a statement of confidence in listing methods for waste disposal that indicate that the barriers to implementing such methods are strictly political.

JUL 21

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July 16, 1981

The Honorable Marilyn L. Bouquard, Chairman
Subcommittee on Energy Research and
  Production
Committee on Science and Technology
U.S. House of Representatives
Suite 2321 Rayburn House Office Bldg.
Washington, D. C. 20515

Dear Representative Bouquard:

I am responding to your letter of July 9, 1981 concerning my testimony before your Subcommittee on H.R. 1909 on June 17, 1981, and the accompanying list of questions. I note that I have not received the mentioned transcript of the hearing for review of my testimony and comments. In the following paragraphs I have attempted to respond to your questions as follows:

1. The data from a technology demonstration site will be exceedingly useful irrespective of whether such a site meets the requirements for a full-size licensed repository. The operation of a technology demonstration site will provide experience for better definition of the data requirements for a licensed repository; provide better data concerning rock mechanical properties and the behavior of certain types of rocks under the thermal and radiation stresses anticipated, and provide a needed experience factor in the total operation of a repository.

2. I believe that we will be able to meet needs for repositories in the years ahead, despite my observation that good repository sites are difficult to find. The characterization of an area involves examination of its geological properties on a broad scale as a first step. Site characterization requires detailed examination of geological properties. Rock and fluid heterogeneity may not become evident until site characterization is undertaken. Nevertheless, I am reasonably certain that many areas are sufficiently homogenous that appropriate sites can be identified.

3. I do not believe that site characterization can be accomplished only with surface techniques, such as geophysical measurements. The interpretation of geophysical data depends ultimately on verification with real rock properties. Accordingly, I believe that physical exploration at depth is needed.

4. To a certain extent, I duck this question. The DOE has documents that most geologists agree would provide specification for full site characterization. However, the length of time required for characterization depends upon the resources that are made available. Additionally, the accessibility of the site may be an overriding factor. In a very general way, close-space seismic investigations, hydrologic characterization, and drilling could be accomplished in a matter of several years. However, as in the Gulf Coast, salt dome characterization has been delayed because of refusal of private owners to allow entry.

5. I continue to believe that groundwater is the most likely avenue by which radionuclides can reach the biosphere. Accordingly, the most important geological research and development activities relate to hydrologic characterization, including potential for groundwater to reach a repository, and the factors involved in the mobilization, fixation, and transportation of radionuclides in host rock. I believe that fracture permeability is one of the geological factors that we cannot analyze with confidence.

6. From my point of view, the Lyons, Kansas site was abandoned because of the potential for water intrusion not only from oil and gas wells, but also from nearby salt-solution mining operations. Lyons could have been continued as a research and development site even under the conditions of H.R. 1909, as long as options for retrievability were maintained. However, Lyons also would have been a poor choice as a full-size repository for reasons other than geological factors. For example, the repository would have been partly under the City of Lyons. I agree that careful planning and site characterization would be desirable before moving forward with emplacement of radioactive waste, even in a demonstration facility.

7. Simulated tests using heaters only provide data concerning heat flux. Heaters cannot simulate radiation flux.

8. I believe strongly that both engineered barriers and geologic characterization are important in designing an acceptable repository. The geological media are the first line of defense, and engineered barriers provide insurance. I am concerned that H.R. 1909 focused primarily on engineered barriers.

9. I do not know whether the NRC multiple site characterization procedures are necessary, but such procedures provide opportunity for site characterization in different host rocks, provide choices, and should provide a higher level of confidence in the ultimate choice.

10. I would support a modification of Sec. 4(b)(3) which would permit expansion of the research and development facility into a full-scale repository if all the requirements of the law could be met. Site characterization is an expensive undertaking in both time and funds, and I feel that it would be a tremendous waste to abandon an excellent site. As I noted before the Subcommittee, good sites are difficult to find.

I wish your Subcommittee success in dealing with this most difficult problem.

Sincerely yours,

William W. Hambleton

William W. Hambleton
Director

WWH:ds

Enclosure

Mrs. BOUQUARD. Dr. Hambleton, DOE projects up to nine 1,000-acre repositories by the year 2000 and even more, depending on nuclear-power growth afterwards. In view of your concerns on the availability of good repository sites, do you believe this country will be unable to meet its needs for repositories in the years ahead?

Dr. HAMBLETON. I think the country will be able to satisfy its needs for repositories, but I think the goal must be achieved carefully. As I say, I think regional hydrology, and rock heterogeneity are of critical importance. Rocks change rapidly within short distances. However, I think the task must and can be done.

Mrs. BOUQUARD. What do you believe are the key questions that need to be addressed in the selection and characterization of a repository? How long do you project it would take to answer these questions, Dr. Hambleton?

Dr. HAMBLETON. From the geological point of view?

Mrs. BOUQUARD. That is correct.

Dr. HAMBLETON. There are extensive studies that have been undertaken and are being undertaken now in major areas of the country. They include the Paradox Basin in Utah, the Palo Dura Basin of Texas, Gulf Coast, Salt Domes, Nevada, and Hanford. These regional characterizations are underway at the present time.

Some of this work is not complete and will take a year or several years to complete before specific site selection takes place. And I think that is somewhat the timetable that we are talking about.

Mrs. BOUQUARD. You mentioned in your testimony that you felt it would not receive the necessary cooperation from the States. In what areas do you think—in site selection? What areas do you think we will have conflict with our States?

Dr. HAMBLETON. In almost every area, ma'am.

Mrs. BOUQUARD. Thank you very much for your testimony.

Dr. HAMBLETON. I am serious. I think that the amount of State legislation that has been passed in the last several years in almost every State prohibiting in some way high-level waste, low-level waste, or almost any kind of waste, is a problem with which the Congress must contend.

Mrs. BOUQUARD. Thank you very much, sir.

I would like to point out that although this legislation would prohibit the use of the sites for commercial repositories, that in no way precludes later changes from this prohibition if in the opinion of the executive branch the sites should be expanded. That is a decision that would have to be made on broader scale legislation which we have deferred for later consideration.

I think that this legislation is necessary for jurisdictional reasons within Congress, which many of you will recognize. I think if this decision is made, I would expect that all the preconditions set for full-scale repositories would apply before the R. & D. facility would be utilized.

Mr. Berick, I am looking over some of the things you have presented. I realize that you represent a rather broad coalition of environmental groups and that your testimony is not quite as reasoned as it was in the past when you appeared before the committee. But I really must admit to you today that in my years in Congress, I have never heard a more self-serving statement on nuclear waste disposal.

I think the point of view presented here today provides a false, distorted, and negative view of this legislation. I think in reading it, you can see that we provided the needed direction and near-term focus for the Department's terminal isolation program. I think the data and experience which these demonstration facilities are meant to provide will enable us to proceed logically to a full-size licensed repository.

And I think in the testimony today, which I understand purportedly represents an environmental consensus, all that has been offered is more of the same, more research, more study, more delay, but certainly nothing to provide any solution.

I think you also noticed that DOE has a rather comprehensive site-selection criteria, as noted in its confidence rulemaking documents. Why would you say this criteria does not exist?

Mr. BERICK. The criteria, Madam Chairman, has never been formally adopted, as has been suggested in legislation that the House passed last year, that there be formal rulemaking criteria for site selection so that everybody knows that the criteria have been applied uniformly across all of the sites that DOE is looking at. And that simply hasn't been done.

Mrs. BOUQUARD. What do you think should be done with high-level civilian waste? Do you think we should just allow it to continue to accumulate?

Mr. BERICK. No, I don't. And the Environmental Policy Center has supported the legislation that passed the House last year. We worked very hard to try to assure passage of that legislation. We believe it was a reasonable program. We think that it is essential that we establish a comprehensive nuclear waste program. We thought we had one last year in the legislation that this House adopted.

Mrs. BOUQUARD. Since this bill very specifically spells out the R. & D. nature of the facility and its limited life, why do you persist in the notion that nobody is going to believe what Congress intends to happen? Isn't this saying that we are passing laws we don't think will be obeyed?

Mr. BERICK. No, I don't believe that is the case. I believe that the direction that H.R. 1909 goes is to restrict what R. & D. would do. It would assure that we end up in the same pitfalls that we have been in in the past. To propose that we pick sites for emplacement of nuclear waste within 180 days after enactment of this legislation, I think is self-defeating when we have seen the controversy that this raises around the country.

The same situation, I think, applies to the kinds of standards that are proposed in the bill. If we are out trying to demonstrate to the public that we know how to dispose of nuclear waste, it would seem to me we should go out and try to prove that we can meet what the NRC says we should meet rather than a set of artificial standards as proposed in the bill such as this notion that we should reach a period of time for engineered barriers that is similar to the decay period that we reach in uranium ore. I think if we are looking at ways of demonstrating to people that, yes, the Department of Energy knows how to dispose of waste, that we were at least trying to meet or exceed what the NRC says we should do.

Mrs. **Bouquard**. Mr. Brown, wouldn't you expect the States as a matter of course to veto location of a repository in their States and throw this decisionmaking to the Congress, Mr. Brown?

Mr. **Brown**. I don't think that will necessarily be the case. The States feel that there should be a method of appealing differences between the States and the Department of Energy to higher authority. The options offered last year were to appeal to the President or to the Congress. We feel in terms of dealing with the public that it is beneficial to be able to say that there is that appeal mechanism.

States currently are engaged in a number of activities attempting to facilitate relations between the Department of Energy and their own waste disposal officials. There is, for instance, a State Working Group on High-Level Radioactive Waste Management composed of States who are potential hosts for high-level waste.

The intention of this group is to discuss among the potential host States and DOE official ways of facilitating relations. The objective is to avoid those instances where you have to appeal to the higher authority.

In this regard, National Governors' Association policy, until a year ago, requested an absolute veto on the part of the States. That is, States would be able to terminate a DOE project simply by saying so. Obviously, Congress is not going to grant that power to the States, but that was official policy of the National Governors' Association.

We changed that position last summer by adopting a comprehensive policy regarding State/Federal relations in which States said, "We are not asking for an absolute veto; we are requesting only that the Federal Government not preempt States in certain areas."

The idea is to achieve, through consultation and concurrence the resolution of conflicts before you get to a total impasse. On the other hand, we do feel that it is important to have that ability to appeal ultimately to Congress.

Mrs. **Bouquard**. Dr. Draper, would you like to respond to this question on whether we would expect the States as a matter of course to veto the location of repositories in States?

Dr. **Draper**. I think the States ought to be fully involved in the process of site selection for a permanent licensed repository. But I believe that if States are given a veto on the selection of a research, development, and demonstration, facility, they will feel compelled initially at least, to veto the site.

Mrs. **Bouquard**. Thank you very much.

Mr. Winn.

Mr. **Winn**. Thank you very much, Madam Chairman, for your consideration. I yield to the members of the subcommittee.

Mrs. **Bouquard**. Mr. Goldwater.

Mr. **Goldwater**. Dr. Hambleton, what, at least based on your knowledge, in your opinion is the best medium, best formation, of rocks for some kind of repository?

Dr. **Hambleton**. I don't know if I can answer that question really. I think salt is probably a satisfactory medium, partly because it has been studied more intensively as a host rock than other types of rock. If the salt occurs under the appropriate circumstances, where salt in solution does not take place, is sufficiently deep, and so on, I think it can be a very satisfactory medium.

Other types of rock can be appropriate if there is sufficiently low fracture permeability, which is a problem with granites, and basalts, as at Hanford. If you can go deep enough and find appropriate places where fracture permeability is low, these kinds of rocks also may be satisfactory.

I don't think you can make the generalization that any given type of rock is satisfactory. It may be under appropriate circumstances, and it may not be under other circumstances. And that, of course, is the difficulty in finding a location.

You look for exactly the opposite of what you look for when you are trying to find an oil and gas field or an ore deposit. You look for a non-ore body. You look for a place that is absolutely dull geologically. Such places are difficult to find.

Mr. GOLDWATER. You can't do this on the surface; you actually have to drill down in there?

Dr. HAMBLETON. I think ultimately you must, yes. You can do a certain amount of remote sensing kind of work, geophysics, seismology, and so on, but ultimately, you have to put a hole down and find out what the rock looks like.

Mr. GOLDWATER. We have quite a bit of experience in doing that now?

Dr. HAMBLETON. Yes.

Mr. GOLDWATER. Do we not have areas defined that are dull that you are talking about?

Dr. HAMBLETON. We have some very broad areas defined that look reasonably dull right now. The trick right now is to narrow these sites down to specific places that look as dull as possible.

Mr. GOLDWATER. I understand what you are saying. What is the main problem with basalt. I have always heard of basalt as most——

Dr. HAMBLETON. Basalt, B-a-s-a-l-t?

Mr. GOLDWATER. Yes.

Dr. HAMBLETON. It tends to joint in a columnar fashion. When a volcanic flow cools, it develops vertical joints which could be entry ways for fluids. That is its major problem.

Mr. GOLDWATER. Is that fractured throughout or is that sort of an isolated situation?

Dr. HAMBLETON. No, it is a fairly common occurrence with basalts. It is a fracture in a sense, but it is a fracture caused by the cooling of the material.

Mr. GOLDWATER. Is the fracture generally completely through a formation or——

Dr. HAMBLETON. No, it may not be, or it may terminate on a lower flow.

Mr. GOLDWATER. Dr. Draper, I wanted to ask you how dependent are utilities on future ordering of nuclear facilities in closing the fuel cycle?

Dr. DRAPER. I think there are several things that are inhibitions to the ordering of nuclear plants at this time. One of them is the public concern about radioactive waste management. The other things include less than expected load growth, financial difficulty of utilities, regulatory uncertainties in the licensing process, the length of time required to construct reactors, and the like.

But it is perfectly clear, if you look at public surveys of any type that ask questions about nuclear power, that among those people who have reservations about nuclear power or who are nuclear opponents, one of the key issues is the disposal of high-level radioactive wastes. People perceive inaction as inability to act. I think a major step forward could be taken could we convince people that in fact we know how to dispose of high-level radioactive wastes. I am not saying that with that done, there would be an instant resurgence of supporters for nuclear plants, but it would certainly help that situation.

Mr. GOLDWATER. Of course, that is one of the purposes behind this effort—to demonstrate that ability and also provide opportunity to learn at the same time. I think that is a thing that I found concerns a lot—the unknown.

What I have discovered is that we have been studying the issue for an awfully long time. We have spent an awful lot of money on it. And at some point in time, you have to move from basic studies to demonstrating what we know. Based on that knowledge, I think everyone is in a better position to make comments, including during the licensing process as well as during the States review process.

Dr. DRAPER. I would certainly concur with what you say. I think most people in the technical community who have been active in the study of the disposal of radioactive waste would say we have gained a tremendous amount of information over the last 25 years from laboratory studies, calculational studies, and the like. But at some point, it is necessary to place real materials in real media in order to complete our knowledge of the engineering, the logistics, the subsurface geology. And until that is done, the problem will never be solved.

Mr. GOLDWATER. Madam Chairman, I have one last question to Dr. Hambleton.

Do you see any problem or do you have any objections to possibly using vitrified waste from the West Valley in this demonstration facility?

Dr. HAMBLETON. I can think of none particularly.

Mr. GOLDWATER. You don't see any problem with it?

Dr. HAMBLETON. No.

Mr. GOLDWATER. Thank you.

Mrs. BOUQUARD. Thank you very much, Mr. Goldwater.

I think since we do have a vote on the floor, it would be wise for us to break for 10 to 15 minutes for a recess and then resume our hearings.

Mr. LUNDINE. Madam Chairman, because I have to catch a plane, I will be unable to return. I would like to ask unanimous consent that I be allowed to ask at least one or two questions in writing.

Mrs. BOUQUARD. Without objection, you will be allowed to submit your questions.

[Recess.]

Mrs. BOUQUARD. We will resume our hearings at this time.

I would like to apologize to our witnesses today that we had to have this time delay, but this is part of the congressional policy and program. We do apologize.

At this time, we would like to recognize the ranking Republican on this subcommittee, Mr. Manuel Lujan, for any questions that he might have.

Mr. LUJAN. Thank you, Madam Chairman.

I will start off with the easy one, I guess. Mr. Brown, what you are looking for is congressional override rather than just the vague consultation and concurrence; is that correct?

Mr. BROWN. That's correct.

Mr. LUJAN. What is the Governers' organization position? A one-house positive veto or no action meaning it is okay? What is the position?

Mr. BROWN. Our position is if the State has objections to the DOE plan, it may appeal to Congress. And it would require both houses of Congress to approve the DOE plan.

Mr. LUJAN. That is the toughest.

Mr. BROWN. That's right. Last year, the Congress modified the legislation. The version that passed the House and Senate required that one house sustain the State point of view.

Mr. LUJAN. That's another way.

Mr. BROWN. That's right.

Mr. LUJAN. On the site selection, Mr. Berick, your main objection is the 180 days. You say by having that in there is the delay factor. Is that basically the position?

Mr. BERICK. Well, I think the basic position is that you are going to have to explain to people who live in the State that is being selected that you are really proceeding on a very orderly basis; that there are particular criteria; that they are not being singled out. And I think that the 180 day issue is not so much the particular time period, but the fact that there needs to be a process by which you arrive at that particular site and can defend it.

Mr. LUJAN. That's what we are trying to guard against.

As I have told you before, God bless the scientists. You know, some of my best friends are scientists. But you never really get the final answer. It is always this is what it ought to be, but I can tell you we have got another thing that is really much better than this one. And then they solve that one, and there is always another one right down the road.

And I think the 180 day figure is in there to kind of get away from that; to say "by 180 days."

What would you say would be the proper time? Would you say 1 year, 2 years, 3 years, 10 years, 27 years? What kind of range do you think so that we wouldn't delay it? Because we are all concerned with the delay.

Mr. BERICK. As we said in the testimony, we believe that you could carry out site characterization activities, including the emplacement of wastes within a 1987 date that this act envisions for operation of a demonstration repository.

Mr. LUJAN. That means you indicate the site way before that.

Mr. BERICK. That's right. As I said earlier, we supported the bill the House passed last year which set a timetable for selecting sites. I would want to go back and review that particular timetable and in light of what the Department of Energy is now proposing to do. They are proposing to speed up the process and not get to granite formations under their timetable.

At this point, we would stand by the timetable that was in the bill. I think it was H.R. 8378.

Mr. LUJAN. That was the Udall procedure, the one for licensed respositories rule. What you are talking about is Udall rather than 180 days?

Mr. BERICK. That's right.

Mr. LUJAN. It is my understanding—and any one of the four that has some knowledge on it—we have punched holes all over the country already, looking for sites. Shouldn't we know—Dr. Hambleton, you sort of answered that a little while ago—already what is suitable or what isn't?

Apparently, the Department of Defense concluded from those holes that they punched over in Carlsbad that WIPP is suitable for its purposes. Why can't we, if we know that WIPP is suitable—or at least somebody knows—say, "Well, lets put a repository in Louisiana or at Fort Lyons"—I don't know anything about it technically, but basically it was a political decision that stopped work at Lyons. The Congress voted. It ended up as a prohibition in an appropriation bill that none of this money shall be used for putting waste repositories in Fort Lyons.

There may be a very valid technical reason for the Lyons decision but in the final analysis, it was a political decision. Don't we know enough about other sites?

Dr. HAMBLETON. Can I attempt to answer that question?

Mr. LUJAN. Not the Fort Lyons one; do we know enough about all the others?

Dr. HAMBLETON. Let me give you an example. What you said about the WIPP site is possibly true, but you understand the WIPP site isn't under consideration here.

Mr. LUJAN. I understand that, but it is similar in that eventually somebody has to say, "This is good enough for a waste repository in demonstration of high-level waste disposal," because that is what it is.

Mrs. BOUQUARD. Dr. Hambleton, pull your microphone a little closer, please.

Dr. HAMBLETON. If I may take an example, the Palo Duro Basin which is in the Texas Panhandle, centered in Amarillo. There has been a hard look at the Palo Duro Basin. I think to the best of my knowledge, nobody has found any reasons why the Palo Duro should not be used at this point.

Mr. LUJAN. Then let's use it.

Dr. HAMBLETON. The Palo Duro is a big piece of real estate. And to zero down on a place to look is going to take more than 6 months.

Mr. LUJAN. How long?

Dr. HAMBLETON. Well, the DOE has plans to proceed with studies that involve the Palo Duro within a total timeframe which is approximately the one specified in this bill, but they are not going to do it in 60 days.

Mr. LUJAN. This is 180.

Dr. HAMBLETON. Six months; I mean about 6 months. So it takes a little more time to zero down on a site within a large piece of real estate.

Mr. LUJAN. We have a general idea, though, of about five, six or seven, areas around the country?

Dr. HAMBLETON. Yes.

Mr. LUJAN. You just need to zero in on those five, six or seven?

Dr. HAMBLETON. I think that only one hole has been drilled by the DOE in the Palo Duro Basin.

Mr. LUJAN. We have done it in Michigan, we have done it in New York, we have done it in Louisiana. I don't know about the site-specific, but we have done them in several places.

Dr. HAMBLETON. Several in the gulf coast, right?

Mr. LUJAN. Any reason why this facility should not eventually become a permanent disposal facility? It seems to me that if we find that a place is good enough for a research repository that those same characteristics would make it a permanent repository candidate.

Dr. HAMBLETON. Well, you see, in a sense, I am agreeing with you unless you pick the site so casually that within a short time that you can't really justify it.

Mrs. BOUQUARD. Would the gentleman yield?

Mr. LUJAN. Certainly.

Mrs. BOUQUARD. I believe that if the wrong site should be chosen, it would cease operation so a whole lot would not be lost, and we would be pointing to another site.

Mr. LUJAN. You addressed the question of the 40 full-sized canisters, and we won't have them. Will West Valley produce 80 canisters or 40 by 1987 and another 40 by 1988? Your general opinion.

Dr. HAMBLETON. I raised the question as a question. I don't know.

Mr. LUJAN. Dr. Draper?

Dr. DRAPER. I think it is unlikely they will have 80 full-sized canisters on that timeframe, but I believe the experimental work can be equally well done by using spent fuel. I think we would have some full-sized canisters of waste on that time scale from activities at Hanford and elsewhere but probably not as many as 80. But we shouldn't prohibit spent fuel being used for the demonstration purposes.

Mr. LUJAN. Without reprocessing?

Dr. DRAPER. Yes.

Mr. LUJAN. My general impression would be if we reprocessed, we reduced to about 10 percent of the volume.

Dr. DRAPER. I think that is correct. I think the things that will be learned from operating the demonstration facility could equally well be learned by using spent fuel.

Mr. LUJAN. Do you think it would be out if we ever sought to bury the spent fuel?

Dr. DRAPER. No, I don't.

Mr. LUJAN. I certainly don't.

Dr. DRAPER. No, I don't. And as I understand the bill, it is a research development and demonstration facility. We could in principle retrieve all that material at some point in the future. So I think what we will learn from just handling of the material, the subsurface geology techniques for implacement and what have you, could equally well be learned by spent fuel if we did not have the solidified radioactive waste.

I don't look on a lack of solidified radioactive waste as something that would inhibit activities in such a facility.

Mr. **Lujan**. One final question, Madam Chairman. I'm afraid my time is just about out.

Mrs. **Bouquard**. Please proceed.

Mr. **Lujan**. I don't want to pursue any more.

Dr. Draper, you make a very definite statement that the basic technology is in hand, meaning that we could do it tomorrow if we set our mind to do it. Do you feel that way?

Dr. **Draper**. I believe that we have done all of those things that are necessary to be done in the laboratory or in calculational activities that are useful. I believe the next step in a logical chain is to pick a site, excavate the site, and place the materials and validate the things that we have predicted from our surface activities. These things cannot be done in the laboratory. It has to be done in a real site with real material.

So what I would say is I believe we have done an adequate amount of work to justify proceeding to site selection and placement of materials. That is not to say that we know everything we will ever know about waste management. But it is impossible to learn those things without picking a real site.

Mr. **Brown**. Congressman, if I may respond to your previous question regarding whether there is any reason why you should not convert a demonstration repository to a permanent facility. Technically, the States would have no objection to that. It obviously makes sense. There aren't that many suitable sites around.

If you are investigating a site and after 10 years you find there are no technical disqualifying factors, it would make sense to continue to develop it. The questions the State would raise involve State participation.

Under this bill, there would be limitations on that participation.

Mr. **Lujan**. But if we had the congressional override provision, that is no complication.

Mr. **Brown**. That is right. Then, the review procedures would commence with site characterization and would be identical with those pertaining to a permanent repository, and the States would certainly be satisfied with that.

Mr. **Lujan**. Thank you, Madam Chairman.

Mrs. **Bouquard**. Thank you very much, Mr. Lujan.

Mr. Wolpe.

Mr. **Wolpe**. Thank you, Madam Chairman. And I thank also the gentleman from New York for allowing me to trade with him in the sequence here in order for me to go to the floor in just a few minutes.

I want to speak, Dr. Draper, about your observation with respect to spent fuel being suitable for testing the sites. You are aware that legislation as drafted does not provide for spent fuel as the test material would only be reprocessed material?

Dr. **Draper**. I am aware, and I believe that is a shortcoming of the draft legislation.

Mr. **Wolpe**. I just wanted to clarify that.

Dr. Hambleton, it has been stated by the industry in the past that there is indeed a scientific consensus with respect to the best means for the disposal of radioactive waste materials. How firm a consensus is that? To what degree is there scientific dissent about the best means of approaching the radioactive waste disposal question?

Dr. **Hambleton**. I really don't know how to answer that question. I think certainly, it is true that most of the people with whom I deal in one way or another feel that this is the most satisfactory way to deal with it; that is, in a geological host rock as compared with other kinds of disposal—outer space, deep burial, and so on—that in general the technical means are at hand; that we really do need to find out how these fuels behave in research and development sites.

There are obviously people who don't agree with that.

Mr. **Wolpe**. Who are some of the people who don't agree with that that would have scientific reputability?

Dr. **Hambleton**. I don't know that I can give you that. I'm sorry, I am not answering it very well, but I just can't come up with an answer.

Mr. **Wolpe**. To an extent, is there a consensus about the characteristics of the site that would be most suitable for this kind of R. & D. effort?

Dr. **Hambleton**. Well, criteria have been developed as part of DOE activities in anticipation of NRC requirements. They are of a general character. I am having trouble recalling this kind of thing right now. But I don't find any marked disagreement with those general criteria:

That there be an absence of ground water, but if you have it, it is a very long-flow path. Those kinds of things. I don't find a great deal of disagreement.

Mr. **Wolpe**. For example, you referred earlier to the issue of salt, significance of salt depositories.

Dr. **Hambleton**. Yes.

Mr. **Wolpe**. It is difficult to generalize, but under what conditions would the presence of salt not be suitable?

Dr. **Hambleton**. There are ways in which the salt can dissolve. There is a dissolution front, for example, in the area where the salt outcrops. It dissolves and collapses. If the site is remote from such places, then salt solution is low. If salt domes are in a ground water regime where the salt can be dissolved, obviously, that is not a good place. And that's why extensive geohydrology studies must be made concerning the regional hydrology before decisions are made firm about the selection of such a site.

Mr. **Wolpe**. So in other words, while there may be a general consensus about an approach to the identification of the geological medium for depositing these wastes, there is as yet no consensus as to which particular sites would be safe for this experience?

Dr. **Hambleton**. I think that is a true statement.

Mr. **Wolpe**. You referred earlier in your testimony, Dr. Hambleton, to the Lyons, Kans., question——

Dr. **Hambleton**. Yes.

Mr. **Wolpe** [continuing]. And what took place in Lyons, Kans., some year ago. My recollection—and I wonder if you could help clarify the situation—is that the State in that instance objected to the AEC's decision to establish a waste disposal site in the abandoned salt mine.

Dr. **HAMBLETON**. Correct.

Mr. **WOLPE**. Why did the state object at that point and what was the reason of the AEC not abiding by the State objection?

Dr. **HAMBLETON**. Well, at that time, the objection, as a matter of fact, came largely from me. There were two reasons at that time.

Mr. **WOLPE**. What was your role at that time?

Dr. **HAMBLETON**. I was a State geologist at that time also.

One reason, I thought the data were insufficient at that time. I think that situation has been fairly largely corrected.

The other is that Lyons, as a site, I consider to be bad geologically for the reasons that I have just described. There were too many ways in which water could access the site through abandoned oil wells, through movement of ground water, which we knew about through the operation of a hydrologic salt mining operation nearby. There were just too many ways that fluids could reach the salt. And that's why we thought it was technically a bad place.

I still think that.

Mr. **WOLPE**. Why was it that you were unable to elicit a sympathetic hearing on the part of the AEC at that point?

Dr. **HAMBLETON**. I think I am in guessing, in a way, speculating, but I think the AEC had become committed to a solution, and as would other large organizations where a commitment was made. The thing was simply rolling, and it had, somewhat the character of a juggernaut. It was impossible to decide otherwise at that point.

Mr. **WOLPE**. As you know, the legislation before us today provides for a period of 180 days within which the initial site selection is to be made. I would be interested in whether you feel that 180 day provision is reasonable to accomplish the kind of careful scientific investigation that you have indicated is necessary.

Dr. **HAMBLETON**. Personally, I think that is too short a time. I really do.

Mr. **WOLPE**. Thank you very much.

Mrs. **BOUQUARD**. Mr. Ottinger.

Mr. **OTTINGER**. Thank you, Madam Chairman.

I would think that the opponents of the expansion of nuclear power would most likely want to adopt this bill quickly because I think it would delay for a considerable amount of time the ultimate solution to this problem. But I think that is not a responsible course to take.

And at least, Mr. Berick, the environmental organizations have come out in favor of a solution.

We have what is a very vexing environmental problem in and of itself in the long-term disposal of waste.

Dr. Hambleton, the NRC has said that it serves little purpose—indeed, they think it is unnecessary—to dunk a bunch of radioactive material in a hole and pull it back out again in order to make the determination with respect to the repository.

I would like to ask you, presumably one of the reasons of testing out a particular geological site would be to find out the interaction between the host geological media and radioactive material. How long would it take to get definitive conclusions from that kind of a test?

Dr. **Hambleton**. I can't answer that.

Mr. **Ottinger**. You are talking in terms of decades, aren't you? You aren't talking about something where you see these canisters that you are going to lower in incapsulated in some kind of vitrification and then putting some kind of, as I understand it, something like 100 year detective vehicle?

So that the real significance of your geological repository is what happens after the protective coating disintegrates and the geological formation has to be the barrier to radioactivity. So that merely lowering the bunch of canisters into a hole for a period of a year or two isn't going to prove anything except an attempt to satisfy the public; isn't that true?

Dr. **Hambleton**. No, I don't think that is quite true. I think it is very difficult to extrapolate over extremely long periods of time except by modeling techniques. But you can certainly generate good data within relatively short periods of time which are far more useful than no data at all and, therefore, make a better estimation prediction of how that material may behave over long periods of time.

Mr. **Ottinger**. Wouldn't you be far better in lowering spent fuel rods which are actively radioactive in this hole if you are going to try and do that instead of protected canisters?

Dr. **Hambleton**. I am not sure I understand the import of the question.

Mr. **Ottinger**. The import of the question is: if you are going to determine the interaction between a geological site and a radioactive material and how well the site is going to contain those radioactive materials, then you don't want something that is heavily protected lowered into the site; you want something hot.

Dr. **Hambleton**. Well, you are getting a little beyond me. I claim competence as a geologist, not as an expert on the waste itself. But you have two very different kinds of material involving different volumes, involving different amounts of uranium and plutonium, in involving different radiation flux, involving different temperatures, I presume. And so they are two different kinds of material. One is incapsulated and vitrified; the other is not. And so they are different.

I suspect that my colleagues can answer that question better than I can.

Mr. **Ottinger**. Does anybody want to take a try at it?

Dr. **Draper**. Yes, I think there are many things to be learned in a demonstration facility, but one of them is not the chemical interaction between radioactive waste constituents and geological media, certainly not in the short term.

The things that would be learned, for example, would be things like thermal response, what the response of the medium was to a source of heat, whether it be spent fuel or radioactive waste. One would be able to learn all sorts of engineering logistical things about the difficulties of placing the materials in the repository. One would learn about the occupational exposures from such an activity, things of that sort, but not the migration of radioactive species through the geologic medium.

That wouldn't be learned under any circumstance at the present time or very long periods of time. That would have to be done in a different fashion.

Mr. OTTINGER. It is the NRC's position, as I understand it, that the problems of worker exposure, handling of materials and so forth, the packaging problems, are generic, and they can be worked at anywhere, regardless of the particular site. The suitability of the site as a long-term repository can't really be tested within a reasonable time so far as its effectiveness as a barrier to radioactive materials can be tested with respect to heat without lowering canisters down. And there are plenty of other ways to make heat.

So I wonder what the purpose of this exercise is. DOE testified yesterday in our hearings that this test and evaluation site which they are proposing is going to cost several hundreds of millions of dollars, and they think it will take about 10 years in order to be able to get the conclusions from it. And going through that exercise, not learning any significant data doesn't seem to be sensible.

But I think it is likely to divert funds away from your permanent depository.

Dr. DRAPER. I would certainly hope that would not be the case, and I think it need not, but I think the point you make is an important one. And that is the information one would learn from such an activity wouldn't necessarily be tied to whether or not that site is suitable as an ultimate dispositional site.

One would gather the data from a site that one would hope would be ultimately suitable. But if not, the data gathered would still be very valuable. You would learn about the handling of real materials in the mine environment. You would learn about the near-field activities in terms of temperature response, occupational exposure, and should it turn out that that site was not suitable, then you would still have gathered valuable information and should not be hesitant about backing away from that site.

I think the tragic thing would be to attempt to gather that information on a site one was committed to and be unwilling to back away from it.

Mr. OTTINGER. I take it you agree, then, with the other panelists—I don't recall your answer—if the test site does prove to be suitable, it ought to be available as a permanent repository?

Dr. DRAPER. Yes, I do.

Mr. OTTINGER. Now, the standard that is proposed in this bill, Dr. Hambleton or Dr. Draper, or anybody else, is a different standard than that that is being required by the NRC. The standard is that the exposure shall be no more than the radiation emitted by the uranium.

As I understand it, the NRC is requiring zero emissions. Is the test evaluation or the demonstration, whatever you are going to call it, going to be really useful if it doesn't meet the NRC standards?

Dr. DRAPER. I think the time a uranium ore body poses a potential health impact depends on the models used for the biological impact of various species. With the ICRP standards, I would prefer to see something other than the uranium ore body as the standard. Whether it is the specific time or not, I am not prepared to say.

Mr. OTTINGER. Indeed, it is going to be very hard to get anybody to accept the site, isn't it, that has uranium ore body as a standard? Under certain circumstances, that can pose a hazard.

Dr. DRAPER. I think because uranium ore bodies come in a wide variety of shapes, sizes, and proximities to the biosphere, it is not a very useful standard.

Mr. OTTINGER. This bill calls for two of these repositories. The Department is only calling for one. Is there any advantage in having two? Do you support having two?

Dr. DRAPER. I think to the extent you have repositories in different media, you are likely to learn different things. So in principle, I support the idea of two respositories, provided that you learn different things from different ones, that they are not duplicative.

Mr. OTTINGER. Dr. Hambleton, you were concerned about removing one site from consideration. I assume that your concern would be double if we remove two sites from consideration as this bill presently calls for.

Dr. HAMBLETON. I don't think I really made that kind of a comparison. It just seemed to me that if one had expended all the effort and money in developing what proved to be a good site, then it would be foolish to walk away from it—one, two, or three.

Mr. OTTINGER. Mr. Berick, I take it you feel as I do that the most sensible things in terms of promoting an ultimate solution would be if you are going to have a test and evaluation to have it subject to NRC licensing?

Mr. BERICK. Yes, I do.

Mr. OTTINGER. Two of the three sites the DOE wants for a repository are on DOE reservations—Hanford, Wash., the Nevada test site.

Dr. Hambleton, do you know whether there is any criteria—or any other panelist—for selecting those just because they are on DOE reservations? Are those indeed the best sites that have been looked at today for making this type of a test or having a permanent repository?

Dr. HAMBLETON. No, I don't. I have no personal experience with either Hanford or Nevada.

Mr. OTTINGER. Yours is just Lyons?

Dr. HAMBLETON. No, I have been active in the Palo Duro/gulf coast salt domes, even the WIPP site, but I have had nothing to do with either Nevada or Hanford.

I think the question is an appropriate one, frankly.

Mr. OTTINGER. All right, I want to thank the Chair and the witnesses for their assistance.

Mrs. BOUQUARD. Thank you very much.

Mr. Ottinger, I want to go back to one point I tried to stress, and I don't think really carried through. In our legislation, the Secretary shall identify—identify, now—at least two geographically distributed demonstration facility sites in the continental United States. This states that the sites should be identified. This does not say that we should begin the work at this time. This merely says that the sites should be identified.

And I tried to bring this out earlier, but I think again we ought to make this clear for the record.

Mr. Berick, I was a little confused about the statement you just made to Mr. Ottinger that you were in favor of licensing. And in your statement, you said that the site characterization activity should, of course, be carried out with the concurrence of the Nuclear Regulatory Commission.

Would you care to comment on that? I didn't refer to State licensing.

Mr. **Berick**. We are talking about two different things, I think. One is Congressman Ottinger mentioned testing and evaluation facilities and characterization is a step, even proposed in your bill, that leads to the development of the facility itself.

We are in favor of having a specific role for the NRC in approving the characterization plan.

Mrs. **Bouquard**. That would be for the full-scale facilities?

Mr. **Berick**. Excuse me?

Mrs. **Bouquard**. The full-scale repositories?

Mr. **Berick**. No, we are in favor of having NRC oversight of the characterization plan based upon the premise that this is a site that will be eventually available for a full-scale repository.

Mrs. **Bouquard**. We discussed that on your first round of questions. And I said, in fact, you are not making the statement to say that Congress would not go back on their word; we didn't mean what we passed in the legislation?

Do you or do you not think we mean what we say when we pass legislation?

Mr. **Berick**. I think, as other members of the panel have said here today and as the record of such sites as the WIPP site, New Mexico, the mission of these facilities is highly variable. And I don't believe that there is an assurance that these facilities will be limited to the particular demonstration that you have proposed.

Mrs. **Bouquard**. This is a matter of legislation, Mr. Berick. This is the scope of this legislation. That's what we are talking about today. Do you or do you not believe we intend to do what the intent of the legislation is?

Mr. **Berick**. I am not questioning the Chairman's intent.

Mrs. **Bouquard**. Well, the scope of this legislation is to provide for R. & D. facilities, not full-scale repository. So NRC would not need to license this facility.

I would like to go back to the testimony, your testimony, of February 26 of this year on this same subject. Today, you said that it is unfortunate this legislation is aimed at addressing political problems rather than technical.

In February, you said that I think this H.R. 1909 with the emphasis on research and technology development is a significant improvement over its predecessor H.R. 7418. Rather than a series of three floating demonstration repositories, H.R. 1909 makes a much more constructive proposal to structure and, in the words of the staff question to focus the waste disposal research program at DOE.

Would you care to comment on this?

Mr. **Berick**. I agree it is an improvement over its predecessor bill, H.R. 7418, which did not even link the demonstration projects to an overall research plan. This bill at least says that DOE's waste research program should be integrated into the development of these facilities.

I think there needs to be, if we are going to go ahead with these kinds of facilities, there should be integration at least into the research requirements of the Department in this area.

Mrs. **Bouquard**. Thank you very much.

Another thing I would like to have some comment on from Dr. Draper is on the hazards. And it seemed to me, I think there is much more political appeal to provide a waste form that is resistant to release of radionuclides that is comparable or equal to the uranium ore bodies that generate such. I think it is an improvement on nature.

Would you care to comment in view of your statement to Mr. Ottinger?

Dr. **Draper**. Yes. The comment I had was that uranium ore bodies are not uniform. There are some uranium ore bodies near the surface of the earth, some far from the surface of the earth. The degree to which they impose hazards depends upon the likelihood of release and so forth.

So I think it is a difficult standard to meet until one specifies a particular ore body with a given uranium ore concentration. I just think it is a hard bench mark against which to compare a radioactive waste depository, although in general, I believe it is a useful concept to say we are comparing something that is man made and something that is natural.

I believe it is a little bit difficult to make that comparison at this point.

Mrs. **Bouquard**. You agree it has political appeal?

Dr. **Draper**. Yes, I do.

Mrs. **Bouquard**. The hazards reduced below those found in nature is the point I was trying to make.

Dr. **Draper**. Yes.

Mrs. **Bouquard**. Thank you very much.

Mr. **Ottinger**. Would the gentlelady yield on that point?

Mrs. **Bouquard**. It is Mr. Goldwater's time.

Mr. **Ottinger**. Would the gentleman yield?

Mr. **Goldwater**. Yes.

Mr. **Ottinger**. I would like to have Mr. Berick comment on that question since in his testimony he indicates not only is there a vast range of uranium ore bodies, but uranium ore in general constitutes a specific health hazard. USEPA has estimated a potential risk from a generic uranium ore body to the U.S. population of 100 to 1,000 cancers per year.

Mr. **Berick**. Yes, Congressman. This is an area that I have addressed several times before this committee on this bill and the predecessor bill. As Dr. Draper said, this is a very ambiguous kind of standard. And the EPA went back and looked at this particular issue with regard to what the relative risks would be in comparing uranium ore bodies to the proposed geological repositories. And they did do this risk estimate that shows for a generic ore body, by no means representative of either of the extremes, that the risk was somewhere around 100 to 1,000 cancers per year of the U.S. population.

Mr. **Ottinger**. So you think that is an inappropriate standard?

Mr. **Berick**. Yes, I do.

Mr. **Ottinger**. Thank you, my friend from California.

Mr. **Goldwater**. I would like to ask a question of the panel if anyone has an opinion on this—whether they would recommend changing or adding to this bill to include spent fuel.

Dr. **Draper**. Yes, Congressman Goldwater. As I have already said several times, I believe it would be useful to offer the flexibility of including spent fuel as a radioactive substance in addition to that of solidified radioactive waste. I don't think it should be exclusive either of one or the other. I think it is useful to have that flexibility.

Mr. **Berick**. Congressman, I went a little bit further than Dr. Draper on page 7 of my testimony in the recommendations that I made for changes in the bill, in H.R. 1909. I suggested that spent fuel be included as a waste form that should be explored, not only to take advantage of the work that has been done in this area, but also to recognize that spent fuel disposal itself may be a very realistic option for utilities and in some cases, with the problem of disposal of failed fuel or fuel that for other reasons is not practical to reprocess, that one would want to have an option for disposal.

Mr. **Goldwater**. Dr. Hambleton, in your opinion, are there geological formations suitable for all waste forms or are specific types of geological formations unsuitable for certain forms of waste?

Dr. **Hambleton**. I think the prior statement would be correct. I don't think that the waste form would make that much difference in terms of the host medium. I think the way it would be placed would be significant, but I don't think it would make that much difference.

Mr. **Goldwater**. Mr. Berick, in your understanding of nuclear programs, I wonder how would you recommend that national policy be changed or the Department of Energy go about building a better public confidence in our ability to dispose of radioactive wastes?

Mr. **Berick**. Congressman, like yourself, I have to represent a variety of constiuencies. Sometimes, I am representing constitutencies that live next to nuclear powerplants who don't want the waste stored in the powerplants. Today, I have to represent not only those folks, but people who live in the vicinity of proposed waste repository sites who are concerned about the environmental impact and public health impact of a waste repository in their backyard.

Last year, we supported, we continued to support, the bill that the House passed at the close of the 96th Congress. We believe it is a sound basis for carrying out a technically and politically defensible waste disposal program.

Mr. **Goldwater**. You feel that would go a long ways toward building confidence?

Mr. **Berick**. Yes, I do.

Mr. **Goldwater**. The mere fact that really not much will happen for quite a few years because of that approach—in other words, leaving the waste still lying around—would build confidence?

Mr. **Berick**. I don't feel it is fair to characterize it as a process in which there is not much happening in the next few years. The folks in Louisiana and Mississippi and Palo Duro Basin and Utah and other places know that things are happening. They know that the Department of Energy is bringing drill rigs in to drill in their backyards. I think a great deal is happening.

We have to be just as sensitive to the concerns of those areas that are the host States, those areas where the political pressure, to say nothing about the greatest interest in the technical and public safety issues, will arise is going to be in those States. And there is going to be a lot happening. There clearly is.

Mr. GOLDWATER. Dr. Hambleton, one statement that you made that concerns me a little bit is the fact that in deciding demonstration facilities, we may be giving away good sites and that there are not that many good sites. How can you justify that kind of statement?

Dr. HAMBLETON. Well, I guess I justify it through long experience as a geologist. I make it in the general terms that rocks are heterogeneous. My engineering friends seem to think they are homogeneous, and they are not. They change very rapidly from place to place. And when one identifies an exceedingly good site with reasonably good homogenous properties, I would like to stay with it. They are difficult to find.

Mr. GOLDWATER. Is that a consensus of those in the field of geology, those that face the problem?

Dr. HAMBLETON. I would hope reasonably so, yes.

Mr. GOLDWATER. Thank you, Madam Chairman.

Mrs. BOUQUARD. Thank you very much, Mr. Goldwater.

Mr. Ottinger, further questions?

Mr. OTTINGER. No, thank you.

Mrs. BOUQUARD. If there are no further questions, I do want to thank our panelists for participating in our hearings today. And I want to thank them for their time and consideration.

And I would ask all of the panelists if they would agree to written questions on this subject from members of this subcommittee.

Thank you very much.

Our hearings will reconvene in the morning at 9:30 when we will hear from Secretary Edwards or his designate, Dr. John Gibbons or someone who will stand in for him or Dr. Joseph Henry.

This subcommittee will stand adjourned until 9:30 in the morning.

[Whereupon, at 4:04 p.m., the subcommittee was recessed, to reconvene at 9:30 a.m. on Thursday, June 18, 1981.]

QUESTIONS FOR DR. WILLIAM HAMBLETON,
KANSAS GEOLOGICAL SURVEY

1. If a technology demonstration site is chosen which later is determined not to meet the requirements for a full-size licensed repository, will this compromise the value of data obtained? In other words, will the data not be acceptable as demonstrating the technology for HLW disposal?

2. DOE projects up to nine-2000 acre repositories by the year 2000 and, of course, even more depending on nuclear power growth afterwards. In view of your concerns on the availability of good repository sites, do you believe this country will be able to meet its needs for repositories in the years ahead?

3. Some geologists believe that site characterization can be accomplished in certain cases by surface techniques, that is, physical exploration at depth is not needed. Do you agree?

4. Based upon your experience what activities are required to properly characterize a site and how long should this take? Is it the same for all media.

   What is your preferred media for a repository and why?

5. What do you believe are the key R&D questions that need to be addressed in the selection and characterization of a repository? How long do you project it should take to acquire the answers to these questions?

6. It is my understanding that the Lyons, Kansas site was abandoned as a potential repository for high level radioactive wastes in the late 50's largely because of the discovery after the project was underway of possible water intrusion into the site as a result of holes drilled nearby for gas and oil exploration. Doesn't this point to the necessity of careful planning and extensive site characterization before moving forward with emplacement of radioactive wastes in a demonstration facility, particularly unlimited quantities as included in H.R. 1909?

7. What technical information can we gather from emplacement of high level radioactive wastes in the ground as proposed in H.R. 1909 that we cannot gather from simulated tests using heaters?

8. How would you evaluate the relative importance of focusing on engineered barriers as opposed to geologic characterization and exploration of geologic medias in designing an acceptable repository system for radioactive wastes?

9. Do you believe that the site characterization procedures as defined by the N.R.C. are necessary to establish an appropriate level of confidence that emplacement of radioactive waste in the ground can proceed in an acceptable manner?

10. Would you support a modification to Sec. 4 (b)(3) which would permit the expansion of the T&E facility into a full-scale repository if all the requirements (including siting requirements) of the law regarding commercial repositories could be met (assuming such generic legislation is later enacted)?

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October 20, 1981

Marilyn L. Bouquard, Chairman
Subcommittee on Energy Research
and Production
U.S. House of Representatives
Suite 2321 Rayburn House Office Building
Washington, C.C. 20515

Dear Chairman Bouquard:

I am pleased to provide responses to the questions you posed subsequent to the hearing you chaired on nuclear waste management legislation on June 17, 1981.

Responses to Questions

1. How dependent on closing the fuel cycle (disposal of high-level nuclear waste) are the utilities in proceeding with the ordering of nuclear power plants?

   A. Closure of the backend of the fuel cycle is very important in assuring the public that radioactive wastes are manageable. Until the public has such an assurance there will be concern about expansion, or even combined operation, of nuclear facilities. In my opinion, waste management legislation is one of about three requirements for a resumption of nuclear plant orders. The other two are stabilization of the regulatory process and restoration of the utilities to financial health.

   How important is a facility, like that noted in H.R. 1909 or the T&E facility proposed by the Department, to the utilities?

   A. A demonstration facility is a useful first step toward a full scale repository provided it neither deflects resources from the repository nor removes a potentially good site from the inventory of possible sites. The demonstration facility would give hands on operational experience at a scale larger than we have previously been able to obtain. If the site chosen for the demonstration facility proves acceptable, it should be available for expansion to a full scale repository.

2. Do the utilities expect that the waste disposal costs will be added to the users electrical bill?

   A. Yes, waste disposal is a legitimate component of the cost of providing electricity. This cost should be included in electric rates.

   How will the utilities calculate the incremental cost?

   A. The cost will be based either on a one time fee assessed by the government at the time of delivery of spent fuel to the government, or on a fee levied at the time of power generation. The fee should be adjusted from time to time by Congress to reflect costs actually incurred for waste disposal but the adjustments should not be retroactive.

   Will a technology demonstration facility help to establish a credible cost estimate?

   A. Yes. The operation of a demonstration facility will provide operating experience to enable more accurate estimation of costs for a full scale facility.

3. H.R. 1909 focuses primarily on a technology demonstration for the emplacement of high-level radioactive waste. Do you believe that the bill should include:

   - technology demonstration for LLW also
   - scale up capability to full-size licensed repository
   - any other specific changes

   A. In my opinion, there is no need for low level waste demonstration. We already have adequate experience with this technology. It would be highly desirable not to foreclose the option for scale up to a full repository.

   The other change I would recommend would be to allow the use of spent fuel as well as solidified waste for demonstration purposes.

4. H.R. 1909 has been greatly simplified from its predecessor bill H.R. 7418 in terms of the details provided. Do you believe that the intent of the Subcommittee is adequately noted or are more details needed?

   A. I believe the intent is clear but, as stated above, I believe the inclusion of provisions to allow for spent fuel and the expansion to a full scale repository would be useful.

5. Do you believe that the emphasis in H.R. 1909 is adequate to expedite the solution to our high-level radioactive waste management problem?

   A. Yes.

6. Would you recommend that spent fuel be included as a waste form to be used in the T&E facility?

   A. Yes.

   If yes, please explain the benefits of doing so. Would your answer to this question be the same if President Reagan reversed the Carter Administration's indefinite deferral of reprocessing?

   A. The benefits would be to provide material for emplacement more quickly than solidified waste would be available and to allow for disposal of damaged fuel. Although I am a proponent of reprocessing, I believe the time scale on which reprocessing will be available is inconsistent with the requirements of H.R. 1909.

7. Would you support a modification to Sec. 4 (b)(3) which would permit the expansion of the T&E facility into a full-scale repository if all the requirements (including siting requirements) of the law regarding commercial repositories could be met (assuming such generic legislation is later enacted).

   A. Yes.

Sincerely,

E. L. Draper

E. Linn Draper, Jr.
Senior Vice President
Engineering & Technical Services

Enclosure

ENVIRONMENTAL POLICY CENTER
317 Pennsylvania Ave., S.E., Washington, D.C. 20003
202/547-5330

August 3, 1981

Hon. Marilyn L. Bouquard, Chairman
Subcommittee on Energy Research
and Production
U.S. House of Representatives
Washington, D.C. 20515

Dear Madam Chairman;

Attached are answers to written questions concerning H.R. 1909 forwarded by your letter of July 9, 1981. I apologize for any inconvenience caused to you or your staff for taking longer than the requested seven days.

Please note that the attached answers represent my views on behalf of the Environmental Policy Center and they do not represent the views of the other organizations which signed on to the Center's June 17th testimony.

Sincerely,

David Berick

David Berick
Washington Representative

Question 1) Recognizing the responsibility and jurisdiction of the Science and Technology Committee over the Department of Energy's research and development functions, I acknowledge the Chairman's interest and intent to limit the scope of H.R. 1909 to nuclear waste R&D. I remain convinced, however, that the enactment of a program for the construction of R&D facilities to demonstrate permanent disposal will do little to further either technical or institutional progress in this area. The letter and intent of my testimony on June 17th was not intended to question the Chairman's intent, but to underscore my belief that the proposed R&D program was simply not desireable. I am sorry if there was confusion over this point.

I think that the Committee can make a valuable contribution to solving the nuclear waste problem by asserting greater oversight over the DOE waste programs which are unfortunately in the process of being divided into separate commercial and defense components. I believe that the Committee should insist that DOE's programs are capable of, and directed to, timely compliance with NRC's high-level waste disposal regulations(10 CFR Part 60). This direction of the DOE waste R&D programs could be done through the annual authorization and appropriations process and may not necessarily require special legislation. Past efforts at the DOE to develop a National Nuclear Waste Management Plan, as requested by President Carter in February 1980, and the Earth Science Technical Plan should be utilized. However, the inclusion of a "charter" delineating DOE's R&D goals and the establishment of R&D management plans and reports to Congress on the achievement of these goals could be a valuable part of a comprehensive nuclear waste bill.

Question 2) My concern over the allocation of DOE' nuclear waste program resources is not over their adequacy, but over the requirements of sections four and five of H.R. 1909 which require the DOE waste R&D budget to accomodate the demonstration facility program. The costs of such a facility have not been established, but some sources have estimated the cost to be upwards of $100 million. Constructin of this facility and the accompanying waste solidification facilities authorized in Section 4(c) represent a significant reallocation of program resources which can be expected to jeopardize other R&D goals and programs.

Question 3) I support the goal of developing full-scale licensed geologic repositories for the disposal of high-level radioactive wastes in a timely manner. I fully agree with the observation that the DOE program is extremely diverse and in need of specific guidance and oversight if it si to achieve this goal. However, I believe that the only way in which this can be assured is through the enactment of comprehensive nuclear waste legislation which establishes the specific final goals of the waste program, i.e. licensed geologic disposal. As the Committee is no doubt aware, the legislation approved by the Senate last year did not provide for permanent geologic disposal but relied instead upon long-term storage. Until the long-term goals of the nuclear waste program are firmly fixed, the short-term objectives such as those proposed in H.R. 1909 for the waste R&D program are subject to great uncertainty and may be of questionable utility.

I will be pleased to assist the Committee in any consideration of a comprehensive nuclear waste bill.

Question 4) Strictly speaking, the only civilian high-level waste now on hand is at the former Nuclear Fuel Services' West Valley, N.Y. reprocessing plant. As you know, the DOE's remedial program to solidify these wastes has run into controversy over the nature of the New York State/U.S. Department of Energy agreement. I am supportive of the proposed DOE remedial program, but I believe that the final waste form should be the subject of additional examination. DOE should explore the possibility of calcination, as used at the Idaho National Engineering Lab, as an immediate and interim step.

As stated in my testimony, I believe that little is gained by not categorizing spent fuel as a possible waste form and continuing the Carter Administration policy of designing waste respositories to handle both high-level waste and spent fuel.

Question 5) The basic problem with the waste form development program is its lack of emphasis on in-situ performance especially in different geologic media. As a number of materials scientists have pointed out, waste forms can be tailored to buffer waste/rock interactions thereby opening up a greater variety of geologic media and sites for possible use. In addition, criticism has mounted over the inability of borosilicate glass waste forms to operate under in situ repository conditions especially salt brines and has been the subject of debate within the National Academy of Sciences Committee on Radioactive Waste Management over the "Roy Report".

Waste forms are included within the NRC's conceptual definition of the "waste package" in Sec. 60.102. This is appropriate because the entire package must be designed to not only contain the wastes for the first 1000 years(Sec. 60.111), but to limit releases thereafter. It is at this post-1000 year stage that the waste/rock/package requirements and the ability of this system to contain or absorb radionuclides becomes most important under the NRC approach. The NRC "Waste Package Requirements", which as noted above apply to waste forms as part of the package, are spelled out in Sec. 60.135 of the proposed rules. Subsection(a) reiterates in detail the importance of (1)the effects of the site on the waste package and (2) the effects of the waste package on the ability of the geologic media to contain the radionuclides. Additional waste form criteria are addressed Subsection(b) and are, for the most part being addressed by the current program.

While I believe that the NRC has not taken full measure of the advantages towards tailoring the waste form/package towards achievement of geochemical equilibrium and containment within the repository(and has imposed a 1000 year containment period which may conflict with "tailoring" the waste form by interjecting additional counterproductive chemical elements), the NRC criteria are very clear about the need to consider waste/rock interaction for each proposed repository. In my view, DOE's programs are not adequately addressing this fundamental NRC requirement.

Question 6) The Subcommittee has already amended Section 4(b)(4) as proposed in Question 6. While this proposal to provide for the expansion of the T&E facility is a step in the right direction, I do not believe that it goes far enough in establishing 1) that R&D activities carried out at the T&E facility are not "stand alone" demonstrations but address the needs of the overall DOE waste program to achieve compliance with NRC Part 60 requirements, and 2) that the site selection program for the T&E facility is one-and-the-same with the site selection program for full-scale repository sites. As stated above in my answer to Question 3, I do not believe that R&D activities should be established independently from the overall DOE waste program and outside of generic legislation. R&D activities should be a logical development from such legislation rather than the subject of a separate, speculative effort. Furthermore, it is unclear that the activities proposed for the T&E facility defined in H.R. 1909 would provide information to the overall program on a timely basis without deferral of the overall repository program to "wait" for information developed by the proposed T&E facility.

Question 7) The explicit statutory definition of the role of States in the siting and approval process for waste facilities is essential for the future progress of the federal waste program. I concur fully with the suggestion that the State role be expanded beyond a simple "consultation and coordination" process for T&E facilities.

Question 8) As stated previously, DOE's R&D program should be fully integrated into the overall DOE repository program. To the extent that the R&D activities proposed in H.R. 1909 are inconsistent with the direction of the overall program, I would favor bringing H.R. 1909 more in line with the current DOE program. However, it is important to note that the current program has undergone significant changes from that proposed by the Carter Administration. I believe that these changes have not been for the better especially the accelerated site selection schedule and the deemphasis on granite as a prospective disposal media.

Question 9) While the NRC has developed its own R&D program to provide itself with an information base upon which to assess the DOE's nuclear waste program and eventually DOE's site selection and repository design decisions, the NRC has not explicitly established criteria for the DOE's R&D program.

The NRC has only recently proposed technical criteria for the disposal of high-level radioactive waste(46 Fed. Reg. 35280, July 8, 1981). As the notice states,

> "In sum, the technical criteria perform two tasks. First, they serve to guide DOE in siting, designing, constructing, and operating a repository in such a manner that there can be reasonable confidence that public health and safety will be protected. Second, they serve to guide DOE in those same areas in such a manner that there can be reasonable confidence that the analyses, needed to determine whether public health and safety is protected, can be performed." (46 FR 35348, July 8, 1981 "Main Features of the Proposed Rule")

These implied R&D requirements contained in Part 60 are the only NRC quidelines on DOE's R&D program that I am aware exist.

A second issue implicit in Question 9 is whether or not the in situ R&D activities postulated for the geologic R&D waste facility proposed in H.R. 1909 are consistent with the site specific testing requirements necessary for licensing approval by the NRC. I support the NRC's Part 60 requirements for site characterization in 10 CFR 60 Subpart B Sections 60.10 and 60.11.(46 Fed. Reg. 13981, February 25, 1981). The Commission believes that at-depth examination and testing is necessary to adequately characterize and validate potential sites. The NRC recommends characterization of at least three sites.

The R&D program outlined in H.R. 1909, or proposed by DOE for its T&E facility, is more extensive than the in-situ testing required by NRC. The NRC in the preamble to its Federal Register Notice of Part 60 in February, 1981, that the purpose of site characterization is the site specific evaluation of a proposed site and must be performed at each subject site. Site characterization of a similar nature is required in H.R. 1909 itself.

The extensive at-depth experimentation and emplacement of wastes proposed in H.R. 1909 exceeds the NRC testing requirements. Under Part 60 Section 60.11, all site characterization activities are to be informally reviewed and approved by the NRC prior to commencement and subject to review throughout the characterization process. This is clearly at odds with H.R. 1909's proposed site specific activities and with our own views what kinds of activities should be performed at-depth without NRC approval.

Finally, it is unclear what information could be gained at the T&E facility proposed in H.R. 1909 which could not be gained through Part 60 in-situ testing in conjunction with DOE's on-going generic waste research program and its proposed activities at WIPP and the Climax Facility at the Nevada Test Site.

Question 10) As stated in my June 17th testimony, I believe that the foremost problem facing DOE's waste program is the overcoming the obstacles to technically and politically defensible site selection. Not only does the selection of specific sites trigger local and regional political reaction, but each site carries with it unique technical issues. Until DOE has a comprehensive site selection process which sets the dates for when sites will be picked and decisions made on different geologic media and formations instead of DOE management, DOE will be hamstrung with these problems. As Issac Winograd of USGS pointed out in recent article in "Science"(June 26, 1981), careful selection of geologic formations may address many of the technical problems which would otherwise plague potential repositories. Delay and uncertainty are not necessarily avoided by dictated site selection schedules.

Question 11) As noted above, I see little advantage to ignoring spent fuel as a possible waste form. Regardless of Federal reprocessing policies, some spent fuel may simply be uneconomic to reprocess either because of utility or market decisions or because it failed or damaged fuel. Waste repositories can be designed to handle spent fuel and high-level waste. Tying waste repository policies to reprocessing policy would change repository capacity over a rather long time and would not have any immediate effect the program. The tradeoffs in repository design would be lower thermal power for reprocessed waste versus larger volumes of waste materials requiring geologic disposal created by recycle. Reprocessed waste must be dealt with under the DOE defense waste program in any event and a commitment to a parallel spent fuel/high-level waste disposal program would not undermine DOE's capability for handling high-level wastes from commercial nuclear fuel reprocessing should that develop.

STATEMENT OF THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

TO SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
COMMITTEE ON SCIENCE AND TECHNOLOGY
U. S. HOUSE OF REPRESENTATIVES

June 17, 1981

Mr. Chairman, my name is Morgan D. Dubrow. I am Senior Staff Engineer of the National Rural Electric Cooperative Association (NRECA). NRECA is a national service organization representing more than 1,000 rural electric systems in 46 states. These systems, mostly all cooperatives, serve more than 25 million consumers in 2600 of the 3100 counties in the United States. Member of NRECA provide electricity to about 75 percent of the land area of this nation.

We appreciate this opportunity to submit a statement to this Subcommittee to express our views on H.R. 1909.

The generation and transmission cooperatives have invested approximately $6.2 billion and will invest another $1.6 billion covering cooperative ownership of 4800 MW of nuclear capacity. Projects in progress at this time involve cooperative ownership of an additional 1250 MW of capacity with an estimated investment of another $1.5 billion. Therefore, our cooperatives have pledged some $9.3 billion for approximately 6050 MW of nuclear capacity. The nuclear capacity covered by loans or by loan guarantees was over 19 percent of the total generating capacity funded by the Rural Electrification Administration.

NRECA General Manager Robert D. Partridge serves on the Board of the American Nuclear Energy Council which represents more than 100 organizations having an interest in nuclear power including private, public and cooperatively-owned utilities, manufacturers, architect-engineers and various firms in the nuclear fuel cycle.

H.R. 1909 deals with one of the most crucial issues facing our nation--the safe disposal of nuclear waste. We believe the general objectives of the bill are meritorious and we support it because of the great need to provide a solution for the safe disposal of high level radioactive waste as early as possible. NRECA concurs with the statement of R. Greg Snipes, Chairman of the High Level Waste Working Group of the Utility Nuclear Waste Management Group made before this Subcommittee, on February 26, 1981. We also wish to take this opportunity to make the following specific comments on this important legislation.

1. It is our view that this demonstration facility should not be precluded from becoming or being expanded into a permanent disposal facility. Therefore, we respectfully request that the Subcommittee delete Sec. 4(b)(3) which specifically prohibits any demonstration facility from being utilized as a permanent waste disposal facility.
2. Since the United States is not reprocessing spent fuel from civilian reactors, we would suggest that language be included in the bill which would allow for the interim storage of this spent fuel.
3. The technology is presently available for isolating, handling and storing high level radioactive waste. For this reason NRECA would recommend that the time schedule for having a demonstration in operation be moved up to F.Y. 1985.

4. We note that the bill contains language to allow for full retrievability of nuclear waste upon completion of the technology demonstration activities. We feel that the bill would serve a more useful purpose if the phrase (page 5, line 6 of H.R. 1909) "upon completion of the technology demonstration activities" is deleted.
5. We believe the true objective of this bill is to achieve an integrated waste management program that is safe and acceptable to the general public. This is essential in order for our country to go forward with an adequate nuclear power plan program to help meet the expanding needs for electricity.

We reiterate our support for this vital legislation and thank the Subcommittee for the opportunity to present our views.

SE2 SCIENTISTS AND ENGINEERS FOR SECURE ENERGY, INC.

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*Member,
Steering Committee

Affiliations for
identification only

July, 1981

COMMENTS ON

THE DISPOSAL OF COMMERCIAL NUCLEAR WASTE AND THE U.S. DEPARTMENT OF ENERGY

SCIENTISTS AND ENGINEERS FOR SECURE ENERGY, INC.

SE$_2$ is a national, non-profit organization of some 1,000 scholars, scientists and engineers. SE$_2$ is dedicated to bridging the gap between the professional scientific community and decision makers by providing accurate and timely scientific and technical information relating to the sensible development of energy and natural resources and to the protection of the environment. The membership, which includes seven Nobel Laureates, represents a broad and bipartisan body of expertise in energy and energy-related fields and seeks to help the public, press and governments through consulting, public statements, meetings, workshops, studies and testimony.

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SE$_2$

Recent activities in the U.S. Congress and continued public interest make it apparent that there is a desire to see the commercial nuclear waste 'issue' resolved.

The acceleration and improved orientation of the Department of Energy's waste management program are not only desirable but are vitally needed. This reorientation must take into account proper closure of the nuclear fuel cycle.

The policy of the Department of Energy in the recent past has been centered on avoidance of reprocessing of spent nuclear fuel. This policy has been consistent with a laudable objective held throughout the Administrative Branch of the Federal government, of avoidance of further proliferation of nuclear weapons throughout the world. However, in our view the logic that related reprocessing of spent nuclear fuel in the United States with construction of nuclear weapons abroad was flawed and the extended ban on commercial reprocessing in the United States was a mistake. It was partly because of the desire to discourage reprocessing abroad that the DOE program in high level waste management was stretched out in time, and increasingly emphasized the feasibility of permanent storage of spent nuclear fuel without its first having been processed. We see this as a highly irrational conclusion of an extended, nebulous chain of bad logic.

It is vital that Congressional action be directed towards "a return to sanity." An accelerated development of acceptable procedures for high level waste management is necessary with a concentration on high level waste from reprocessing of spent fuel. Anti-nuclear groups have been consistent in converting the reluctance of the past Administration to reprocess fuel into a claim that the storage of waste from reprocessing is an unsolved problem. This of course is not so and it is vital to clear up this error.

There have been suggestions that demonstration facilities for the technology of isolating high level nuclear waste from the biosphere be constructed, and that the period of use in demonstration-type activities could extend from a start-up date of 1987 until the year 2005. This 18-year interval would presumably be a period of test and demonstration of procedures. Of course, simply placing fuel in a repository for this period of time will not prove that it would be isolated from the biosphere for centuries. Therefore, it is vital that research and development on fixing and storage of nuclear waste be maintained over the period required to achieve wide scientific consensus on the preferred form or forms for waste to be stored, the containers for storage, the details of emplacement in repositories, and in short the specifics of the selected waste storage system.

There have been further proposals that would preclude conversion of a technology demonstration facility into use as a permanent disposal facility. We recognize that the reason for this restriction must be to defer selection of a permanent storage location until a time when the demonstrations have confirmed the methods to be used. However, it is also necessary to proceed with some reasonable speed toward identification of a permanent site for storage, and it might be unwise to restrict choices too much. We would recommend that in parallel with a demonstration facility there be an activity to choose a permanent site, and that this choice be based on a separate analysis which takes into account the more extensive requirements that permanency would entail. No site, whether it is a demonstration site or any other, should be selected for permanent use without a full and convincing analysis. But the objective should be to select such a site; it should not be to restrict it or to bar it.

We would further suggest that any proposal for a demonstration facility allow for the use of several technologies for solidification of waste, and require a waste form that is adequately resistant to the release of radionuclides.

Returning to our overall position, we wish to affirm our broad support for any actions directed towards a demonstration of the reality of the technology and science available to safely manage and dispose of commercial nuclear waste. We consider it a matter of vital importance that this country reverse the current position of complete inaction in this area and offer the advice and counsel of the scientists and engineers of SE$_2$ where appropriate.

March '80

STATEMENTS OF CONFIDENCE IN PRESENT METHODS FOR WASTE DISPOSAL

Following are excerpts from statements made by technical experts involved in extensive evaluations of the technological status for disposal of high-level nuclear waste in repositories. This is only a partial list intended to convey the virtual unanimity among technical organizations about the ability for disposal of high-level wastes with present technology and knowledge.

PROFESSIONAL SOCIETIES

Professional societies in the United States make position statements through committees which study the problem. Technical organizations generally have memberships of over 10,000 professionals.

Association for Cooperation in Engineering

This association represents 24 major engineering professional societies in the United States, having a combined membership of over 700,000 engineers. The association convened a working committee, called the Coordinating Committee on Energy, to make statements on various aspects of energy. Its statement is:

> ...Much development of solid waste forms has been done and technology is well in hand, some of it already demonstrated on a large scale....Neither the specifications of solid form nor the location of the repository have yet been decided. It is the lack of these decisions rather than the lack of technology that stands in the way of the disposal of radioactive waste....

American Institute of Chemical Engineers

The Nuclear Engineering Division of this Institute has issued a policy statement. It states:

> ...Satisfactory techniques exist today for safe radioactive materials handling, the reprocessing of spent fuel, and solidification of high-level wastes....Several candidate options for ultimate disposal are ready for demonstration. These techniques are being improved rapidly as the technology continues to advance. Other countries have recognized this, and have overtaken the U.S. in the rate of introduction of efficient nuclear powerplants and waste treatment techniques.... The Institute believes that actual demonstration of radioactive waste disposal is sufficiently urgent that it is far better to proceed with an acceptable solution than to delay by looking for unnecessary minor benefits which might possibly emerge from alaternatives....

Dr. Ernest F. Gloyna testified to the House Science and Technology Committee on March 6, 1980, for this organization. He said:

> ...The design and construction of a facility and the operation of a subsurface repository can be accomplished with existing engineering knowledge. There is a proven technology for the separation of radioactive waste from nuclear fuel -- we have been doing that for years. Wastes can be stored safely on the surface of the earth in interim storage, or placed into suitable geologic repositories -- either permanently or for later reburial. What we lack is not technology, but policy....

American Nuclear Society

The American Nuclear Society, which is a professional society of nuclear engineers, stated:

> ...Based upon various large-scale tests and engineering development in a 25-year research and development program, many prestigious studies in the past few years have concluded the safe disposal of nuclear wastes in a mined repository is an acceptable approach.... The American Nuclear Society believes that expeditious, forthright action is required on the part of the Federal Government to construct and place in operation at a repository for permanent high-level wastes disposal at the earliest possible time, as a part of a national nuclear waste disposal program....

American Physical Society

The American Physical Society, supported by the National Science Foundation, conducted a study on Nuclear Fuel Cycles and Waste Management. The results were published in the professional journal Reviews of Modern Physics. Following are excerpts:

> ...The technology exists for recoverable storage of the spent fuel with minimal deterioration to preserve the associated resources, but full-scale demonstration is required before use....
>
> ...Effective long-term isolation for spent fuel, high-level or transuranic waste can be achieved by geologic emplacement. A waste repository can be developed in accord with appropriate site selection criteria that would ensure low probability that erosion, volcanism, meteorite impact and other natural events could breach the repository....

NATIONAL ACADEMY OF SCIENCES

The National Academy of Sciences (NAS) was founded by the Congress and conducts evaluations of scientific programs for the Nation. It utilizes committees formed of the nation's highly-prestigious scientists.

Committee on Nuclear & Alternative Energy Systems

The Committee on Nuclear and Alternative Energy Systems conducted a multi-year, $4-million study of nuclear and other energies, done by a prestigious group of scientists from around te nation. This report, "Energy in Transition, 1985-2010", reported on January 14, 1980:

> ...No insurmountable technical obstacles are foreseen to preclude safe disposal of nuclear wastes in geological formations. All necessary process steps for immobilizing high- and low-level wastes have been developed, and there are no technical barriers to their implementation....

NAS Review of Nuclear Power Literature

The Summary and Synthesis chapter of the NAS report "Risks Associated with Nuclear Power: A Critical Review of the Literature" concluded:

> ...In conclusion, it may be noted that several evaluations of the waste-disposal problem by groups with access to considerable expertise but not associated with the development of nuclear power have concluded that it is possible with presently available technology to dispose of wastes so as to pose only a negligible threat to the health of future generations....

Radioactive Nuclear Waste Committee Former Chairman's Statement

The NAS has a standing Committee on Radioactive Waste Management, which has formed many panels on various waste management problems. Its immediate past Chairman is Professor Ernest F. Gloyna, who is Dean of Engineering at the University of Texas, Austin. The following excerpts are from Dr. Gloyna's presentation to the National Academy of Engineering, the sister academy to the NAS on November 1, 1979.

> ...Basically, these storage problems present no new difficulties, because throughout the history of the nuclear industry, it has been necessary to consider, evaluate and utilize the multiple barrier concept for radiation control.
>
> ...There is a well-developed technology that can be used to establish a geologic repository for pilot and demonstration purposes. There appears to be no technical obstacle to the selection of appropriate site and the design, construction and operation of a subsurface repository....

Evaluation by Committee Member

Dr. Frank Parker, a member of the National Academy of Sciences Committee on Waste Management, testified to the House Science and Technology Committee. He is Professor of Environmental ngineering at Vanderbilt University, Nashville, Tennessee. He stated:

> ...Basically what we're saying, in our second report of the National Academy of Sciences panel on geological site criteria, the waste solidification report of the NAS and the Swedish report is that by choosing wisely the waste forms, the canisters, the overpack and the geological host material, that one could reduce the migration of radionuclides to practically any level that one wishes. Summing up then, both spent fuel elements and solidified high-level wastes can be safely stored at the present time in geological media....

Evaluation of Swedish Plans

Sweden has prepared a KSB-II disposal plan for spent nuclear fuels. A special Subcommittee of the NAS Radioactive Nuclear Waste Committee has evaluated it as follows:

> ...The plan is unique in placing major reliance on an engineered barrier consisting of thick-walled copper canisters surrounded by the overpacks of bentonite clay. In the Subcommittee's judgement the effectiveness of this barrier to contain the radionuclides in spent fuel rods for hundreds of thousands of years has been adequately demonstrated, and the required properties for the less easily verifiable geologic barriers are therefore less stringent than in other disposal plans. The Subcommittee agrees that the available technical data are adequate to support the conclusion in the KBS-II Plan that radionuclides will not escape at unacceptable rates from a repository built as specified in the KBS-II report, provided that construction is well engineered and a proper site is used....

GOVERNMENT ACCOUNTING OFFICE

The Government Accounting Office of the Congress evaluates programs conducted by the Federal Government. Its June 21, 1979, report on nuclear wastes states:

> ...While it appears that technical problems can be solved, political and public acceptance are major obstacles that will be difficult to overcome....

ORGANIZATION OF THE ELECTRIC UTILITIES

The Electric Utilities of the U.S. have an Electric Power Institute. Its President, Dr. Floyd L. Culler, Jr., testified to the House Science and Technology Committee:

> ...The body of technology developed over this period [of 25 years] has essentially confirmed both the early projections of the adequacy of technical approaches employing vitrified wastes in salt repositories, and the technical adequacy of at least a half a dozen other waste forms and geologic media for the long-term isolation of wastes from the biosphere....

PUBLIC INTEREST GROUPS

The Union of Concerned Scientists

This is a Cambridge, Massachusetts, group of scientists that examines scientific undertakings, usually with an anti-nuclear conclusion. It commented on the U.S. government's Interagency Review Group draft report:

> ...We have concluded, as a result of this study, that although there are great technical obstacles which stand in the way of successful implementation of a waste disposal program, these obstacles are not insurmountable....

The Natural Resources Defense Council (NRDC)

This technologically qualified group generally opposes nuclear power. It has offices in Washington, D.C., and Palo Alto, California. Dr. Terry Lask of the Palo Alto office is quoted in Fortune magazine on March 26, 1979 (page 99), saying:

> ...I think there is a high technical probability that wastes can be relatively safely and satisfactorily disposed of. I am not sure that technically competent people will be working on it or that our political processes will let us implement it before the end of the century....

Dr. Thomas Cochran of the Washington office of NRDC testified as follows to the Science and Technology Committee:

> ...Safe permanent disposal of nuclear wastes in mined geological repositories is technically feasible, at least in theory.
>
> ...because of the extremely long time period during which the nuclear wastes remain hazardous, nuclear waste management involves important ethical considerations. However, nuclear waste management is far from unique in this regard. The coal technology with its CO_2 and solid waste problems and the fact that it is a nonrenewable resource presents the same ethical concerns. Unlike nuclear waste management, some of these problems with coal appear intractable....

OTHER NATIONS

Other nations of the world have studied nuclear waste disposal and agree with the technical evaluation that technology currently exists. Following are some of these evaluations:

International Atomic Energy Agency

The International Atomic Energy Agency is an agency of the United Nations devoted to atomic energy. Its summary report on nuclear waste disposal stated:

> ...The technology for handling [high-level wastes] is developed, the difficulty is in deciding which of several methods whould be used on a commercial basis....

Sweden

A Swedish law required a comprehensive study of nuclear waste management for the government. This was done by an organization entitled Kärn-Bränsle-Säkerhet. It concluded that there were no technological difficulties and assessed the safety by:

> ...Even in the case where a number of unfavourable assumptions have been made, the calculated changes in the radiation environment are considerably less than normally occurring natural variations. These natural variations do not have any effects on either man or ecological systems which can be demonstrated today. The calculated maximum radiation doses due to leakage from a final repository are below the limit values for nuclear power plants which have been issued by the radiation protection authorities in Sweden. The proposed method for the final storage of high-level waste glass is therefore deemed to be absolutely safe....

Canada

The Minister of Energy, Mines and Resources of Canada commissioned a study, "The Management of Canada's Nuclear Wastes", by a distinguished panel chaired by F.H. Hare. Its August 31, 1977, report stated:

> ...From all our considerations, we now believe deep geological burial is a potentially very safe method of disposal. This accords with recommendations being made in several other countries....

Australia

J.M. Costello, of the Atomic Energy Commission in a 1977 report concluded:

> ...The technology for safe management of radioactive waste is already available. It now remains to gain public confidence by demonstrating ultimate disposal methods and their safety....

United Kingdom

Great Britain had an extensive inquiry done about the Winscale reprocessing before the Honorable Mr. Justice Parker. His January 26, 1978, report stated:

> ...I accept the evidence that a vitrification process will be successfully established. The stage of development has, I consider, been reached, when success can be confidently predicted....

On the other hand, he cautions:

> ...On the question of disposal of the solidified waste Professor Tolstoy drew attention to a large number of points which showed that a final solution to the problems of disposal has not yet been found. This I accept....

March '85

STATEMENTS OF CONCERNS

OVER PRESENT METHODS FOR WASTE MANAGEMENT

Although the preponderance of technical and scientific judgements in this country and the world are that technology and knowledge is sufficient to undertake repositories now, some dissents exist. Following are excerpts from the principal dissents.

U.S. FEDERAL ADMINISTRATION STATEMENTS

Interagency Review Group (IRG)

In 1978, President Carter commissioned a 14-agency IRG to review nuclear waste management. Most members were non-technical. The cautions of this group are:

> ...Confidence has now increased to the point where the majority of informed technical opinion holds that the capability now exists to characterize and evaluate media in a number of geologic environments for possible use as repositories built with conventional mining technology and that successful isolation of radioactive wastes from the biosphere appears feasible for period of thousands of years....

Review for the Environmental Protection Agency (EPA)

EPA commissioned a group of geologists, who focused on geology, rather than the engineered barriers on which the NRC is now placing main reliance. This study reported:

> ...It seems clear that the uncertainties of forecasting the behaviors of conceptual high-level waste repositories are due principally to inadequate knowledge of the relevant mechanical, radiochemical, and hydrologic properties of the candidate rock types....

President Carter's Statement

On February 12, 1989, President Carter announced his decision about nuclear waste disposal, based upon the results of his Interagency Review Group (IRG) report. He stated:

> ...Over the past two years as I have reviewed various aspects of the radioactive waste problem, the complexities and difficulties of the issues have become evident -- both from a technical and, more importantly, from an institutional and political perspective....

DEPARTMENT OF ENERGY & TRANSPORTATION
Watkins Building, 510 George Street
Jackson, Mississippi 39202
601 / 961-4733

August 5, 1981

AUG 10 1981

The Honorable Marilyn Boquard, Chairman
House Subcommittee on Energy Research
and Production
Room B-374
Rayburn House Office Building
Washington, D.C. 20515

Dear Madam Chairman:

Re: Comments of the Mississippi
Energy and Transportation
Board on H. R. 1909

Thank you, Madam Chairman, for your response to our earlier comments on H.R. 1909. The nuclear waste program staff has analyzed the proposed legislation, including your amendment, in light of your July 9, 1981, correspondence. We appreciate the opportunity to provide comments on the most important legislation. Our comments will be confined to the amended version of the bill.

The amended version of H. R.1909 appears to be consistent with the DOE program that was announced in March of this year. In the presentation of Dr. Colin Heath at the Atomic Industrial Forum Fuel Cycle Conference, the accelerated program was described in detail. Dr. Heath stated that the purpose of the program was to create confidence in the scientific and private sectors that the necessary waste handling technology was available and was not in need of development. He further stated that the program was being developed to satisfy the procedural requirements of the Nuclear Regulatory Commission as per 10 CFR Part 60. Passage of H.R. 1909 would give congressional authorization to the program and would provide the second step of a comprehensive national radioactive waste management policy. Public Law 96-573 provided the first step. Passage of 1909 would possibly put a stepping stone in place for establishing the reprocessing option alluded to in the bill. The subcommittee is to be applauded for the thought that has obviously been incorporated into the amendment submitted by you and Representative Goldwater.

There are several comments which the Energy and Transportation Board would like to have incorporated into the record if it meets with your consent.

The comments are not restricted to H.R. 1909, but rather are intended to address the National Waste Management issues in general. Technological conservatism and use of a step-wise approach in developing a comprehensive national nuclear waste management policy has been and continues to be the philosophy promoted by Mississippi.

In many respects an "accelerated" program could possibly eliminate some of the technical conservatism which we feel is so critical to the program. Research and Development activities are a critical element in developing the necessary technologies to safety and effectively handle and dispose of nuclear wastes. R&D activities associated with the National Waste Terminal Storage Program are ongoing both at the Nevada Test Site and at the Hanford Reservation. It is our opinion that the nation would welcome the further development of either or both the NNWSI or BWIP programs as the prototypical demonstration repositories. We are in agreement with you that a test and evaluation facility would create confidence in the technology for handling high-level nuclear wastes. Public confidence in the program and acceptance of the program is vital.

A critical element in establishing public confidence and acceptability in any nuclear waste management program is congressional action developing the national nuclear waste management policy. The amended version of H.R. 1909 is a step in the right direction. The doors to the reprocessing option and waste solidification technologies would be opened. Further congressional actions concerning political, institutional, socio-economic and other technical issues would then serve as companion to PL 96-573 and H.R. 1909.

Again, Madam Chairman, thank you for the opportunity to provide comments to you and your subcommittee on this matter of such major national significance. We would welcome your comments and attempt to respond to any inquiries of you or your colleagues.

Very truly yours,

Wilbur G. Ball

Wilbur G. Ball
Executive Director

WGB:RJF:br

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97TH CONGRESS
1ST SESSION

H. R. 1909

To accelerate and provide direction to the Department of Energy's research, development, and technology demonstration program for the disposal of high level radioactive wastes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 18, 1981

Mr. GOLDWATER (for himself, Mr. FUQUA, Mrs. BOUQUARD, and Mr. LUJAN) introduced the following bill; which was referred to the Committee on Science and Technology

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A BILL

To accelerate and provide direction to the Department of Energy's research, development, and technology demonstration program for the disposal of high level radioactive wastes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Nuclear Waste Research, Development, and Demonstration Act of 1981".

FINDINGS AND PURPOSES

SEC. 2. (a) The Congress hereby finds that—

(1) research, development, and technology demonstration is an essential prerequisite to developing the experience, data, and information necessary for the safe disposal of high level radioactive wastes; and

(2) the nuclear waste research, development, and technology demonstration program in the Department of Energy should be accelerated to demonstrate the technically verified methods for the safe disposal of high level radioactive wastes.

(b) The purposes of this Act are—

(1) to accelerate and provide direction to the Secretary of Energy in the research, development, and demonstration program for the safe disposal of high level radioactive wastes; and

(2) to develop the engineering experience, data, and information necessary to confirm the existence of technological solutions for safely disposing of high level radioactive wastes.

DEFINITIONS

SEC. 3. For purposes of this Act—

(1) the term "engineered barriers" means man-made components of the disposal system designed to prevent the release of radionuclides into the geologic media, and includes, among other things, the waste

form, the waste canisters, and other materials to be placed over and around the waste canisters;

(2) the terms "high level radioactive wastes" and "wastes" mean concentrated highly radioactive wastes from reprocessing irradiated reactor fuel.

(3) the term "Department" means the Department of Energy;

(4) the term "Secretary" means the Secretary of Energy;

(5) the term "site characterization" means activities including borings, surface excavations, excavations of shafts, subsurface lateral excavations and borings, and in situ testing to determine the suitability of a site for a demonstration facility but does not include preliminary borings and geophysical testing needed to decide whether site characterization should be undertaken; and

(6) the terms "technology demonstration facility" and "demonstration facility" mean a limited-capacity underground cavity which is used for the purpose of developing data, information, and experience for the safe disposal of solidified high level waste.

TECHNOLOGY DEMONSTRATION PROGRAM

SEC. 4. (a)(1) The Secretary shall, not later than sixty days after the date of the enactment of this Act, bring the existing Department of Energy research, development, and demonstration program for the disposal of high level radioactive wastes in compliance with this Act.

(2) The Secretary shall identify at least two geographically distributed demonstration facility sites in the continental United States. Such sites, to be located in different geologic media, shall be identified not later than one hundred and eighty days after the date of the enactment of this Act.

(3) Site identification and subsequent demonstration facility design shall be based upon the principle that the wastes shall be isolated from the biosphere in such a way that the primary protection is provided by the engineered barriers, developed pursuant to subsection (c), and subsequent isolation is provided by geologic containment.

(4) The Secretary shall conduct the appropriate site characterization activities at two sites identified pursuant to paragraph (2).

(b)(1) The Secretary shall design, construct, and operate a technology demonstration facility for research and development purposes at each site characterized pursuant to subsection (a). The first technology demonstration facility shall be in operation by the end of fiscal year 1987, and the second shall be in operation by the end of fiscal year 1988. Each demonstration facility shall be designed with a capacity for receiving a minimum of forty full-size canisters of vitrified waste produced pursuant to subsection (c), but shall be no larger than is appropriate to carry out the purposes of this Act.

(2) Any technology demonstration facility authorized under this Act shall be designed for full retrievability of nuclear wastes upon completion of the technology demonstration activities. The operation of the demonstration repositories shall terminate by December 31, 2005, unless the Secretary determines that the continued operation of such repositories is necessary for research, development, and demonstration purposes.

(3) No technology demonstration facility shall be converted, expanded into, or utilized as a permanent disposal facility.

(c)(1) The Secretary on a priority basis shall design, construct, and operate waste solidification facilities designed for any suitable technique, including but not limited to vitrification, to provide a waste form that is resistant to the release of radionuclides.

(2) The engineered barriers shall have a design life at least as long as the time period needed for the health hazard of such wastes to become comparable to the health hazard of uranium ore mined to generate such wastes.

(3) Activities under this subsection shall be conducted so that the solidified wastes and engineered barriers will be

ready for placement in any demonstration facility by the date its construction is completed.

(d) As soon as is practicable, the Secretary shall consult and coordinate with the State officials from States in which any potential demonstration facility sites are located regarding the Department's plans for, characterization of, and construction of, the demonstration facilities authorized under this Act.

COMPREHENSIVE PROGRAM MANAGEMENT PLAN

SEC. 5. (a) The Secretary is authorized and directed to prepare a comprehensive program management plan for the conduct of research, development, and demonstration activities under this Act consistent with the provisions of section 4. Such plan shall include a schedule to insure that the facilities authorized under this Act are in operation by the dates specified in section 4. Such schedule shall, to the maximum extent possible, include specific dates for the commencement and completion of construction on such facilities.

(b) The Secretary shall transmit the comprehensive program management plan to the Committee on Science and Technology of the House of Representatives and the Committee on Energy and Natural Resources of the Senate within one hundred and eighty days after the date of the enactment of this Act.

(c) Concurrently with the submission of the President's annual budget to the Congress for each year after the year in which the comprehensive plan is initially transmitted under subsection (b), the Secretary shall transmit to the Congress a detailed description of the comprehensive plan as then in effect, setting forth the modifications which may be necessary to appropriately revise such plan and any changes in circumstances which may have occurred since the plan or the last previous modification thereof was transmitted in accordance with this section. Such description shall also include a detailed justification of any such changes, a detailed description of the progress made toward achieving the goals of this Act, and any legislative or other recommendations which the Secretary may have to help attain such goals.

CONTRACTS

SEC. 6. (a) The Secretary shall provide funds by contract (to the extent provided in appropriation Acts) to initiate, continue, supplement, and maintain research, development, and demonstration activities which are necessary to carry out his duties under this Act. The Secretary may enter into such contracts with any person subject to section 8.

(b) Each contract under this section shall be entered into in accordance with such rules as the Secretary may prescribe under the provisions of this section. The Secretary may enter into contracts under this section without regard to section 3709 of the Revised Statutes (41 U.S.C. 5).

CONSULTATION

SEC. 7. In carrying out the activities authorized under this Act, the Secretary shall consult with the heads of appropriate Federal agencies and other persons as he deems fit.

USE OF FUNDS

SEC. 8. The Secretary shall utilize all funds appropriated pursuant to this Act for purposes consistent with the expeditious completion of each authorized activity, and shall not provide funds, either directly or indirectly, to any person (as defined by section 11 s. of the Atomic Energy Act of 1954) for the purpose of advocating a position on such activity.

CONSTRUCTION OF LANGUAGE

SEC. 9. Nothing in this Act shall be construed to authorize remedial action activities or commercialization activities including the construction or operation of commercial waste management facilities.

AUTHORIZATION OF APPROPRIATIONS

SEC. 10. There are hereby authorized to be appropriated to the Secretary to carry out this Act such sums as may be authorized by legislation hereafter enacted.

H.R. 5016—NUCLEAR WASTE MANAGEMENT COMPREHENSIVE LEGISLATION (BOUQUARD/ LUJAN PROPOSAL)

THURSDAY, JUNE 18, 1981

House of Representatives,
Committee on Science and Technology,
Subcommittee on Energy Research and Production,
Washington, D.C.

The subcommittee met at 9:30 a.m. in room 2252 of the Rayburn House Office Building; Hon. Marilyn Lloyd Bouquard, chairman of the subcommittee, presiding.

Present: Representatives Bouquard, Ottinger, Lundine, Wolpe, Lujan, Lowery, and Goldwater.

Staff present: Louise Ventre, Majority Counsel; Joyce Freiwald, Minority Technical Consultant.

Mrs. Bouquard. Our hearing will come to order.

Good morning. We wish to welcome our government witnesses this morning.

We are here today to receive testimony on a bill of considerable significance to the nuclear energy program of the Nation. This bill, the Nuclear Waste Research, Development and Technology Demonstration Act of 1981 was introduced by Congressman Goldwater, Congressman Fuqua and myself, and Congressman Lujan, the ranking Republican member on the subcommittee.

The bill provides for the temporary operation at sites to be selected by the Secretary of Energy of two technology demonstration facilities, containing a minimum of 40 full-size canisters of glassified, high-level radioactive waste. The bill requires the first demonstration facility to be in operation by the end of fiscal year 1987, the second by the end of fiscal year 1988. The Department of Energy is directed to consult and coordinate with those States where the temporary facilities may be located, as well as consult with the heads of other appropriate agencies. The bill specifically prohibits expansion of these facilities into permanent commercial high-level waste disposal depositories.

Yesterday we received testimony from a diverse group of nongovernment witnesses. Generally, they were supportive of a technology demonstration facility, but to varying degrees. Each suggested ways that either the bill or the high-level waste disposal program could be improved and we will certainly consider their comments and recommendations.

Today our witnesses are from the Department of Energy, the Nuclear Regulatory Commission and the Office of Technology Assessment.

Mr. Sheldon Meyers, Deputy Assistant Secretary for Nuclear Waste Management and Fuel Cycle Programs will represent the Department of Energy, and I am sure there is no need to remind everyone that a successful implementation of H.R. 1909 is largely dependent on the Department and particularly the office under Mr. Meyers.

Representing the Nuclear Regulatory Commission is Mr. Jack Martin.

Finally, we have Mr. Thomas Cotton, Senior Analyst and Project Director for Commercial and High Level Waste Assessment, who will represent the Office of Technology Assessment.

Before we proceed, I would like to reiterate a point that was made yesterday. The technology exists and is basically at hand for us to proceed with disposal of nuclear waste. The most difficult problems preventing our moving forward are institutional and political. This bill is designed to minimize and, hopefully, eliminate these barriers for demonstration of technology. This committee will make every effort to report this bill out.

We look forward to your comments and recommendations, and we will consider them as we do move forward with this bill.

I'd like to invite now Congressman Manuel Lujan to make an opening statement. I'd also like to invite Congressman Goldwater, when he arrives, as the principal author of this legislation, to make an opening statement. I understand, Mr. Lundine, you have a statement.

Mr. Lujan is recognized at this time for an opening statement.

Mr. LUJAN. Thank you, Madam Chairman. After hearing the testimony yesterday, I want to emphasize that the stated purpose of the Nuclear Waste Research, Development and Demonstration Act of 1981 is to accelerate and provide direction to the Secretary of Energy for the safe disposal of high level radioactive waste. We believe that the technological solutions exist for safely disposing of high level radioactive waste and that the Department of Energy's technology demonstration program should be accelerated to demonstrate the technically verified methods for safe disposal of these wastes.

Yesterday we heard testimony that emphasized several issues relating to H.R. 1909, such as whether or not we do have the technology available. Another important issue is the appropriate role for the States in the selection of a site for the demonstration facility.

I personally feel that an appeals process such as a congressional overrule of some kind would be appropriate, and that was articulated as the policy of the National Governor's Council yesterday.

A third important issue is whether or not the demonstration facility should also be considered for later use as a full-sized permanent repository. In addition, I have questions about how long it will take to zero in on an appropriate site. Is the 180 days specified in the bill reasonable or should it be longer?

Madam Chairman, I look forward to hearing from the witnesses today and hope we can work together to develop the government's ability to manage the disposal of radioactive waste.

Mrs. BOUQUARD. Thank you very much.

Mr. WOLPE. Madam Chairman?

Mrs. BOUQUARD. The gentleman is recognized.

Mr. WOLPE. I wanted to state for the record that I think it is important to note that some of us, at least, who have sat through the hearing yesterday have a somewhat different conception of the thrust of the testimony from all of the witnesses. In fact, I heard very substantial reservations being raised by even the industry witness with respect to the vehicle we are using for these hearings, which leads me to simply ask a question, Madam Chairman. What is your timetable? Can you give us some indication as to when you are planning to mark up this legislation?

Mrs. BOUQUARD. Would the gentleman yield? Are you referring to the markup?

Mr. WOLPE. That's right.

Mrs. BOUQUARD. We have not set a time, at the present time, for markup for this legislation.

Mr. LUNDINE. Would the gentleman yield?

Mr. WOLPE. I would be pleased to yield.

Mr. LUNDINE. In that connection, you indicated yesterday that you would be receptive to having hearings with respect to more comprehensive legislation. Do you think it would be possible to have those hearings before a markup is scheduled?

Mrs. BOUQUARD. If the gentleman would yield. We will take under consideration, as I stated yesterday, and will give every consideration to full hearings for your legislation, Mr. Lundine.

Mr. LUNDINE. Prior to the markup of this bill?

Mrs. BOUQUARD. I did not say prior to the markup of this bill. I said that we would give you every consideration in the time frame that the other committees are ready to go ahead with it, with their part.

Mr. WOLPE. If I may reclaim my time, Madam Chairman. I think it would be a travesty on any kind of systematic approach, on this question, since it is so important.

Mrs. BOUQUARD. Would the gentleman yield? I think this is a matter we can resolve among ourselves. We are here today to hear from our witnesses. I think this is imposing on their time. I think we should allow the witnesses to go ahead and give their testimony.

Mr. WOLPE. I'd be pleased. I won't speak much longer. The only reason I was led to make this comment at all was the characterization of the testimony that was received yesterday, which I frankly disagree with, Madam Chairman. Thank you.

Mrs. BOUQUARD. Thank you very much.

Mr. OTTINGER. May I be recognized briefly?

Mrs. BOUQUARD. The gentleman is recognized to make a statement.

Mr. OTTINGER. I would just like to point out that the testimony yesterday, all the witnesses, including the industry witness, indicated disapproval of a provision in here which prevents the demonstration facility from eventually being used as a full-scale depository. There were substantial reservations addressed about the radium standard, the radioactivity release standard, I think by all the witnesses here.

I think in addition there were questions about the availability of canisters, serious questions, about the provisions for State participation in this effort. I don't think the impression ought to be left that there really was universal approval of the approach that was taken.

I thank the gentlelady for yielding.

Mrs. **Bouquard**. Thank you, gentlemen. I think we are all in agreement that there are changes, and we want to see as a purpose of the hearings, to explore the possibilities and implications of this legislation.

Mr. Meyers, if you would proceed with your testimony. You will be followed by Dr. Cotton, then by Mr. Martin. Your testimony will be made part of the record. You may proceed as you wish.

TESTIMONY OF SHELDON MEYERS, DEPUTY ASSISTANT SECRETARY FOR NUCLEAR WASTE MANAGEMENT, U.S. DEPARTMENT OF ENERGY, DR. THOMAS COTTON, OFFICE OF TECHNOLOGY ASSESSMENT; AND JOHN B. MARTIN, DIRECTOR, DIVISION OF WASTE MANAGEMENT, U.S. NUCLEAR REGULATORY COMMISSION

Mr. **Meyers**. Thank you, Madam Chairman, and members of the subcommittee. I am pleased to appear before you today to present the Department of Energy's views on the proposed legislation outlined in H.R. 1909.

I'd first like to express our appreciation for the interest and support of this and other committees of the Congress in trying to resolve nuclear waste management issues. We also recognize the need to act promptly and decisively to establish a system for radioactive waste isolation that is technically sound, safe, and acceptable to the American public.

Before I discuss the specifics of H.R. 1909, I would like to briefly outline the key features of the Department's proposed program strategy for developing such a system. DOE proposes to identify three specific sites at which construction of exploratory shafts to depths would begin by 1983. As a result of the technical status of the program, these three locations will likely be:

a. in basalt flows on the Hanford site in the State of Washington;

b. in welded volcanic tuff on the Nevada test site in the State of Nevada;

c. In a salt formation at a site to be determined by 1983.

The Department is currently conducting investigations of salt domes in the gulf interior region of Texas, Louisiana, and Mississippi, bedded salt in the Paradox Basin in Utah, and bedded salt in the Permian Basin in Texas. In early 1982, a decision will be required whether to concentrate on bedded salt in Texas or in Utah. In 1983, it is anticipated that a decision can be made whether to develop an exploratory shaft in bedded or dome salt.

The sinking of exploratory shafts at three sites should begin in 1983 and our present plans call for their completion by 1985. Examination and in situ testing will be conducted to determine the potential suitability of each site and to verify engineering analysis and modeling.

Following examination of three sites at depth, selection of one site for the development of a test and evaluation facility will be made. This selection is currently scheduled for 1985.

A test and evaluation facility will be designed for the placement of up to 300 packages of solidified high-level waste. The packages will incorporate multiple barriers, will be completely monitored, and will be designed for retrieval. Methods for handling large quantities of waste packages will be developed and experience will be gained in keeping worker exposure to radiation as low as reasonably achievable.

It is currently estimated that design of the facility will require 2 years and that underground construction will also require 2 years. If these estimates are correct, radioactive materials will be emplaced in the facility by 1989.

The first license application for a full-scale repository can be submitted to NRC when two technical conditions are satisfied. I'd like to point out that these are just technical conditions. No assumptions have been made about conditions of State acceptance.

These two are: (*a*) a minimum of three sites in two rock types have been investigated with exploratory shafts; and (*b*) data are available to conduct the predictive modeling of the waste package, repository performance and interactions with the geology that would be required by NRC in a licensing review.

If necessary funding is forthcoming, these conditions could be met by 1987 or 1988, and NRC review of a license application could be conducted in parallel with further development of the test and evaluation facility.

During the development of the test and evaluation facility, investigations of other sites will continue. Measurements at the site of all three exploratory shafts will continue as required. Furthermore, by approximately 1988, it is anticipated that sufficient information will have been collected concerning the salt formations not chosen as one of the first three sites with exploratory shafts and concerning possible locations in granite to allow construction of additional exploratory shafts. Maximum flexibility has been built into the program to allow decisions to be made at a later time concerning the submission of the first license application to the NRC.

We believe that implementation of the strategy I have just described is the best path for achieving the goal of a safe and technically sound waste isolation system. We also believe that it will achieve many of the objectives set forth in H.R. 1909.

With that background, Madam Chairman, I would like to now turn to the specific provisions of H.R. 1909. While we agree with the findings as stated in the bill and the need to accelerate and provide direction for a high level waste research and development program, we cannot support the particular technology demonstration program as proposed in H.R. 1909. The areas of similarity focus on our mutual awareness of the need for what we refer to as a test and evaluation facility and for what the proposed bill calls a technology demonstration facility. In H.R. 1909 the demonstration facility would be precluded from conversion to a permanent radioactive waste disposal facility. DOE does not wish to foreclose the option of using the site of the test and evaluation facility as the location of the first permanent disposal facility.

We believe that such a facility would provide generic engineering information, as well as site-specific information, which could be used to support appropriate technical reviews by the Nuclear Regulatory Commission. We strongly believe that the ultimate program goal of the DOE program must remain a system of licensed full-scale repositories to handle all high-level nuclear waste that will be generated.

The availability of waste disposal is an issue that is continually raised in licensing proceedings for commercial reactor programs. We believe that it is essential that the DOE program continue to make demonstrable progress toward the ultimate program goal, and that any experimental facility be seen as a necessary step toward that goal.

We also agree with the proposed requirement for consultation and coordination with host State and local governments and other Federal agencies during the development of such a facility.

In section 3, the stated definitions are generally acceptable. We note, however, that only concentrated high-level waste from reprocessing is included in the definition of high-level waste. This definition would be acceptable if we were dealing exclusively with the normal fuel cycle operation, but it does not take into account waste generated under abnormal operations—the damaged core at Three Mile Island, for example—which may well warrant treatment as high-level waste. Thus, the bill's high-level waste definition would not allow the Nuclear Regulatory Commission sufficient latitude to define waste according to hazard.

Regarding the design life requirement in section 4, we wish to emphasize that none of the natural or engineered barriers are sufficiently understood to justify total reliance on any single barrier. Instead, we intend to provide a series of backup barriers, both natural and engineered, to help compensate for uncertainties, particularly in areas with limited empirical information. The degree of reliance placed on any particular barrier, be it natural or man made, is still being evaluated with due consideration being given to such factors as cost and durability in some geologic environments.

There are some studies of natural analogs which are continuing as part of the waste isolation program. The field studies at the Oklo Mine in Gabon, West Africa, and the Morro do Ferro thorium deposit in Brazil are but two examples. These studies are intended to extract corroborating data for the mathematical models that simulate physical phenomenon over time scales that are far too long to duplicate in the laboratory or in situ experiments.

For example, these studies would be used to quantify the distances traveled by radionuclides from a natural ore deposit. Then a comparison can be made with predictions made by radionuclide transport models.

Madam Chairman, that completes the formal statement. And at your pleasure, I will be delighted to answer any questions you may have.

[The prepared statement of Mr. Meyers follows:]

Statement of Sheldon Meyers
Deputy Assistant Secretary for Nuclear Waste Management
Department of Energy
Before The
Energy Research and Production Subcommittee
House Committee on Science and Technology
June 18, 1981

H.R. 1909: NUCLEAR WASTE RESEARCH, DEVELOPMENT AND DEMONSTRATION ACT OF 1981

Madam Chairman and Members of the Subcommittee, I am pleased to appear before you today to present the Department of Energy's views on the proposed legislation outlined in H.R. 1909.

I would first like to express our appreciation for the interest and support of this and other committees in the Congress in trying to resolve nuclear waste management issues. We also recognize the need to act promptly and decisively to establish a system for radioactive waste isolation that is technically sound, safe and acceptable to the American public. Before I discuss the specifics of H.R. 1909, I would like to briefly outline the key features of the Department's proposed program strategy for developing such a system.

1. Focus on specific sites -

   DOE proposes to identify three specific sites at which construction of exploratory shafts to depth would begin by 1983. As a result of the technical status of the program, these three locations will likely be:

   a. in basalt flows on the Hanford site in Washington State.
   b. in welded volcanic tuff on the Nevada Test Site in the State of Nevada.
   c. in a salt formation at a site to be determined by 1983.

The Department is currently conducting investigations of salt domes of the Gulf Interior Region of Texas, Louisiana and Mississippi, bedded salt of the Paradox Basin in Utah, and bedded salt of the Permian Basin in Texas. In early 1982, a decision will be required whether to concentrate on bedded salt in Texas or in Utah. In 1983, it is anticipated that a decision can be made whether to develop an exploratory shaft in bedded or in dome salt.

2. Underground Characterization -

The sinking of exploratory shafts at three sites should begin in 1983 and our present plans call for completion by 1985. Examination and in-situ testing will be conducted to determine the potential suitability of each site and to verify engineering analyses and modelling.

3. Selection of one site for a Test and Evaluation Facility -

Following examination of three sites at depth, selection of one site for the development of a test and evaluation facility will be made. This selection is currently scheduled for 1985.

A test and evaluation facility will be designed for the placement of up to two to three hundred packages of solidified high-level waste. The packages will incorporate multiple barriers, will be completely monitored and will be designed for retrieval. Methods for handling large quantities of waste packages will be developed and experience will be gained in keeping worker exposure to radiation as-low-as-reasonably-achievable.

4. Construction and Operation of a Test and Evaluation Facility -

It is currently estimated that design of the facility will require two years and that underground construction will require two more years. If these estimates are correct, radioactive materials would be emplaced in the facility by 1989.

5. Submission of a License Application to NRC for the First Repository - The first license application for a full-scale repository can be submitted to NRC when two technical conditions are satisfied.*

   a. a minimum of three sites in two rock types have been investigated with exploratory shafts; and

   b. data are available to conduct the predictive modelling of the waste package, repository performance and interactions with the geology that would be required by NRC in a licensing review.

If necessary funding is forthcoming, these conditions could be met by 1987 or 1988, and NRC review of a license application could be conducted in parallel with further development of the test and evaluation facility.

During the development of the test and evaluation facility, investigation of other sites will be continued. Measurements at the site of all three exploratory shafts will continue as required. Furthermore, by approximately 1988, it is anticipated that sufficient information will have been collected concerning the salt formation not chosen as one of the first three sites with exploratory shafts and concerning possible locations in granite to allow construction of additional exploratory shafts. Maximum flexibility has been built into the program to allow decisions to be made at a later time concerning the submission of the first license application to the NRC.

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*This discussion is restricted to technical conditions. No assumptions have been made about conditions of State acceptance.

We believe that implementation of the strategy I have just described is the best path for achieving the goal of a safe and technically sound waste isolation system. We also believe that it will achieve many of the objectives set forth in H.R. 1909.

With that background, Madam Chairman, I would now like to turn to the specific provisions of H.R. 1909. While we agree with the findings as stated in the bill and the need to accelerate and provide direction for a high-level waste research and development program, we cannot support the technology demonstration program as proposed in H.R. 1909. The areas of similarity focus on our mutual awareness of the need for what we refer to as a test and evaluation facility and for what the proposed bill calls a technology demonstration facility. In H.R. 1909, the demonstration facility would be precluded from conversion to a permanent radioactive waste disposal facility. DOE does not wish to foreclose the option of using the site of the test and evaluation facility as the location of the first permanent disposal facility. We believe that such a facility would provide generic engineering information as well as site-specific information which could be used to support appropriate technical reviews by the Nuclear Regulatory Commission. We strongly believe that the ultimate goal of the DOE program must remain a system of licensed full-scale repositories to handle all high-level nuclear waste that will be generated. The availability of waste disposal is an issue that is continually raised in licensing proceedings for commercial reactor operation. We believe that it is essential that the DOE program continue to make demonstrable progress toward the ultimate program goal and that any experimental facility be seen as a necessary step toward that goal.

We also agree with the proposed requirement for consultation and coordination with host State and local governments (Section 4) and other Federal agencies (Section 7) during the development of such a facility. In Section 3, the stated definitions are generally acceptable. We note, however, that only concentrated high-level waste from reprocessing is included in the definition of high-level waste. This definition would be acceptable if we were dealing exclusively with the normal fuel cycle operation. But it does not take into account waste generated under abnormal operations--the damaged core at Three Mile Island, for example--which may well warrant treatment as high-level waste. Thus, the bill's high-level waste definition would not allow the Nuclear Regulatory Commission sufficient latitude to define waste according to hazard.

Regarding the design life requirement in Section 4, we wish to emphasize that none of the natural or engineered barriers are sufficiently understood to justify total reliance on any single barrier. Instead, we intend to provide a series of backup barriers, both natural (e.g., solubility constraints, a feature common to both ore bodies and repositories) and engineered, to help compensate for uncertainties, particularly in areas with limited empirical information. The degree of reliance placed on any particular barrier, be it natural or man-made, is still being evaluated with due consideration being given to such factors as cost and durability (of engineered barriers) in some geologic environments.

Finally, we believe that it is important that States shall share in all information during the exploratory phase but that no State shall have a right to delay exploratory work. The Congress has previously addressed legislation concerning formal appeals on siting by a State associated with a decision to build a permanent repository. We propose that formal reviews and appeals by States, similar to those described in legislation passed by the House of Representatives last year, should not be applied to the construction of the T&E facility. To impose this process on the T&E facility, which will be limited to research and development and from which all radioactive material will be removed, would preclude meeting an early date for operation.

Turning now to a specific question posed in your letter, Madam Chairman, we have reviewed the Pacific Northwest Laboratory (PNL) publication entitled "Comparison of Potential Radiological Consequences from a Spent-Fuel Repository and Natural Uranium Deposits." The analysis presented in PNL-3540 is part of the Department's efforts to determine what constitutes acceptable repository performance; while the ore deposit comparison is generally valid it may not be a totally adequate one in all cases, due to some of the proposed regulatory criteria and the great variability in the natural system. The Department supports the report's major conclusion, namely, that repositories are quite comparable to the natural ore deposits and, in the case of disposal of reprocessed wastes, probably present less radiological hazard than their natural counterparts after several hundred years. An EPA study (EPA 520/3-80-009) that uses the same types of calculations that are being used to assess repository performance, shows that population exposures from ore deposits are comparable to any releases that can be reasonably postulated from waste repositories. It should be noted that the location of an ore body is typically in an aquifer, a body of rock comprised of coarse sediments that tends to maximize geological transport of materials. The Department will certainly not locate a repository in an aquifer but will instead look for a geologic environment with more favorable characteristics for isolation, such as slow groundwater movement and high sorptive capacity along the flow paths.

Studies of natural analogs are continuing as part of the waste isolation program. The field studies at the Oklo mine in Gabon, West Africa, and at the Morro do Ferro thorium deposit in Brazil are but two examples. These studies are intended to extract corroborating data for the mathematical models that simulate physical phenomena over time scales that are far too long to duplicate in the laboratory or in situ experiments. For example, these studies will be used to quantify the distances traveled by radionuclides from a natural ore deposit and then a comparison can be made with predictions made by a radionuclide transport model.

Madam Chairman, I shall be pleased to try to answer any questions that you may have at this time.

Mrs. BOUQUARD. Thank you, Mr. Meyers, we will proceed with all of our witnesses and have our questions in the panel forum.

Before we go further, the chief author of this legislation, Mr. Goldwater from California, is here. We welcome you, Mr. Goldwater. Do you have an opening statement that you would like to make?

Mr. GOLDWATER. Madam Chairman, I have no opening statement. I just look forward to listening to the presentation of the witnesses today.

Mrs. BOUQUARD. Dr. Cotton, you may proceed with your statement. We have your written statement. Please proceed.

Dr. COTTON. Thank you, Madam Chairman, members of the subcommittee. I am pleased to have the opportunity today to testify on H.R. 1909, based upon the analysis we performed to date in the Office of Technology Assessment on the project on commercial high-level waste management. Since our project has not been completed, my comments cannot reflect an official position of the Office of Technology Assessment. Also, since OTA does not make policy recommendations, I'm not here today to advocate the options which I will discuss. I will just raise them for your consideration.

I'd like to focus on three issues related to H.R. 1909. First, the possible role of unlicensed demonstration facilities in resolving uncertainties associated with the licensing of repositories.

Second, the advantages and disadvantages of facilities that cannot be expanded into permanent repositories.

Third, the value of rapid development by the Department of Energy of a detailed research, development and demonstration plan.

The primary objective of H.R. 1909 is to demonstrate the technical capacity to dispose of high-level radioactive wastes safely, by placing small quantities of high-level waste in demonstration facilities. Physical demonstration of disposal technology is certainly part of what is needed to show that the Federal Government can dispose of radioactive wastes safely.

Ultimately, however, we will also have to demonstrate the institutional capacity to make a formal regulatory decision that a repository at a specific site will provide the required degree of waste isolation for a very long period of time, 10,000 years according to the tentative EPA criteria. There is considerable uncertainty now about how this would be done.

A major source of the uncertainty is the fact that the ability of the geologic repository to isolate radioactive wastes for such a long time cannot be directly demonstrated in the same sense that a new aircraft can be demonstrated to perform according to its design specifications. For this reason, there would have to be heavy reliance of very long-term predictions of the behavior of the repository, based on relatively short-term measurements of the properties of the engineered and natural barriers and on the use of complex mathematical models to analyze the long-term effectiveness of these barriers. The use of such predictive techniques in the formal licensing process to convince the responsible regulatory body that the repository will meet regulatory requirements for a period of thousands of years may well be the most difficult aspect of demonstrating disposal technology.

Since long-term prediction has never been done in a formal regulatory process, we can anticipate that many unforeseen problems will occur the first time it's attempted. In addition, in many cases, there will have to be analytical procedures developed to use in the licensing process. These will include data collection and validation techniques, methods for validating mathematical models, and the protocols for using the models in analyzing repository performance.

A serious effort to resolve licensing uncertainties before the first formal licensing proceeding commences could avoid unnecessary delays at that critical stage of the waste disposal program. Thus, the resolution of those uncertainties could be a key objective of an accelerated research, development, and demonstration program such as that proposed in H.R. 1909.

Specifically, the unlicensed facilities proposed in this bill and in the test and evaluation program of the Department of Energy could be used by both the Department of Energy and the Nuclear Regulatory Commission to test the procedures and analytic techniques, and to gain experience, which would be later used in licensing repositories. This effort could include a simulation of the licensing process at a demonstration facility as a way of forcing early identification of the resolution of the problems that could arise at each stage in the proposed repository licensing process. If waste is placed in such a facility as proposed in H.R. 1909 and the administration program, licensing issues up to the decision to allow backfilling of a repository could be explored.

The ability to use an unlicensed facility in this way may depend to some extent on expectations about its future use. This brings me to my next subject, which is the fact that the administration's proposed test and evaluation facility is intended to be expandable into a permanent repository, if the site proves acceptable, while H.R. 1909's demonstration facility is expressly prohibited from being made into a repository.

Mr. Meyers has already suggested the principal argument in favor of allowing expansion of a demonstration facility into a repository; that is, that this could reduce or eliminate the potential delays in obtaining a licensed repository that could result from a diversion of funds, manpower, and management attention to activities at nonexpandable facilities that would have to be repeated by potential repositories. Of course, there may be some delays even with the proposed test evaluation facility program. In either case, a judgment would have to be made as to whether the benefits for earlier demonstration activities offset the costs of such delays or whether additional resources should be provided to minimize the delays.

A major potential advantage of H.R. 1909's prohibition of the expansion of any demonstration facility into a full-scale repository is that this may be able to avoid what some people refer to as the "foot in the door" problem—that is, the concern that unlicensed activities at a facility that could be expanded might lead to strong bureaucratic, budgetary, and political pressures for expansion. Fears that such pressures could compromise the integrity of the site selection process, or at least the appearance of integrity, could significantly limit the speed, scale, and flexibility of unlicensed activities allowed at an expandable facility as compared to one which could not become a repository. Such limitations could offset the expected cost savings of expandable facilities to some extent.

With regard to speed, it may be possible to select sites for nonexpandable facilities more quickly than for expandable ones, because a slower selection process might be required for sites that could be used for permanent repositories in order to avoid premature commitments to sites. If useful generic information can in fact be obtained faster from facilities that are precluded from expansion, the early availability of such information may be worth the additional cost.

The scale of unlicensed activities allowed at an expandable facility could be significantly limited because of concerns about the effect of momentum generated by such activities on the integrity of the licensing process. Such concerns would not apply to activities conducted at a facility that cannot be expanded. This could be particularly important if a demonstration facility were intended to be used for a dry run of the regulatory process, all the way through the emplacement of waste, the monitoring of repository performance, and the decision to backfill a room.

Finally, the flexibility of unlicensed activities could be considerably greater at a nonexpandable facility, since there would not be concerns about their effects on the future licensability of that facility. In addition, this lack of concern at a nonexpandable facility about the requirements of any future licensing process may allow closer cooperation between the Department of Energy and the Nuclear Regulatory Commission than would be possible at a facility that could become a licensed, permanent repository. A collaborative exploration of the resolution of technical licensing issues might be considerably easier if it could avoid the adversarial relationship fostered by the formal licensing process.

These potential advantages of nonexpandable facilities probably cannot be realized as long as the "foot in the door" problem remains. That problem may remain unless there is credible assurance that the facility will not in fact be expanded. There are several ways to help provide such assurance.

The first is a legislative prohibition on expansion of the facility, contained in H.R. 1909. However, because the Federal waste management program appears to be suffering from a significant credibility problem, in part because of repeated changes of policy in the past, this may not be sufficient to completely allay concerns, particularly if a proposed site appears to be potentially suitable for a repository.

This suggests an additional possible assurance, which is the deliberate selection of sites that appear relatively unattractive for use as potential repositories. For example, one could use a site that is too small to be economically feasible for an operational repository, such as a very small salt dome. Alternatively, one might use a site that appears unattractive for permanent use in terms of regulatory criteria—for example, a site that is near to economically exploitable natural resources. Using such sites could increase the confidence that demonstration facilities would not be expanded into permanent repositories.

To conclude, I'd like to discuss the potential value of a research, development, and demonstration plan in allaying concerns that have been expressed about the function of demonstration facilities.

For example, some people have questioned the desirability of demonstration or Test and Evaluation facilities unless their technical role in the repository development program is more clearly spelled out. Some are even concerned that construction of such facilities without clearly stated technical goals could reduce, rather than enhance, public confidence in the Federal waste management program.

These concerns could be addressed by requiring the Department of Energy to develop an integrated research, development, and demonstration plan which clearly identifies the technical questions which need to be answered for successful implementation of geologic disposal and lays out a schedule for the activities needed to address those questions.

Specifically, this plan could include a description of the research and development activities that will be conducted at demonstration or Test and Evaluation facilities to resolve specified technical uncertainties, and the role of such facilities in the overall repository development process. In H.R. 1909, such a plan could be mandated simply by expanding the requirements for the program management plan, specified in section 5 of the bill.

Development of an integrated research, development, and demonstration plan that would have high credibility in the technical community could require more time than allowed in the bill for the development of a management plan, perhaps a year, or perhaps longer, rather than the allotted 6 months. To the extent that a well designed plan can make a demonstration program more supportive of the repository development program, however, this additional time could be made up by later savings.

Perhaps more importantly, the development of such a plan could itself build confidence in the Federal waste management effort by providing strong early evidence of progress in the waste disposal program.

Madam Chairman, that concludes my prepared remarks. Thank you for the opportunity to come before the committee today. I'll be glad to answer any questions you may have.

[The prepared statement of Dr. Cotton follows:]

TESTIMONY OF THOMAS A. COTTON
OFFICE OF TECHNOLOGY ASSESSMENT

BEFORE THE
SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY
ON

H.R. 1909: NUCLEAR WASTE RESEARCH, DEVELOPMENT,
AND DEMONSTRATION ACT OF 1981

JUNE 18, 1981

My name is Thomas A. Cotton. I am a senior analyst in the Office Of Technology Assessment, and am currently directing a project on Commercial High Level Radioactive Waste Management. I am pleased to have the opportunity today to testify on H.R. 1909 based upon the analysis we have performed to date in this project. However, since our project has not yet been completed, my comments do not reflect an official position of the Office of Technology Assessment.

OTA does not make policy recommendations, but attempts to identify and analyze key options in a comprehensive and unbiased manner. Consequently, I am not here to advocate the options which I will discuss, but rather to raise them for consideration.

For the sake of brevity, I would like to focus on three issues and possible actions related to H.R. 1909 that our study suggests may be worthy of consideration by this Committee: (1) the possible role of unlicensed demonstration facilities in resolving uncertainties associated with licensing repositories; (2) the advantages and disadvantages of facilities that cannot be expanded into permanent repositories; and (3) the value of rapid development by the Department of Energy of a detailed research, development, and demonstration plan. Although my comments will deal primarily with H.R. 1909, I will also discuss relevant aspects of the Administration's proposed Test and Evaluation Facility program, which you will also be considering today.

Role of Unlicensed Demonstration Facilities in Resolving Uncertainties about Licensing Repositories

A primary objective of H.R. 1909 is to demonstrate the technical capacity to dispose of high level radioactive waste safely, by emplacing small quantities of high level waste in demonstration facilities. Physical demonstration of disposal technology is certainly part of what is required to show that the Federal government can dispose of radioactive waste safely. Ultimately, however, we will also have to show the institutional capacity to make a formal regulatory decision that a repository at a specific site will provide the required degree of waste isolation for a very long period of time -- 10,000 years according to tentative EPA criteria. There is considerable uncertainty now about how this will be done.

A major source of the uncertainty is the fact that the ability of a geologic repository to isolate radioactive wastes for such long time periods cannot be directly demonstrated in the same sense that a new aircraft can be demonstrated to perform according to its design specifications. For this reason, there will have to be heavy reliance on very long term predictions of the behavior of the repository based on relatively short term measurements of the properties of the engineered and natural barriers and on the use of complex mathematical models to analyze their long term effectiveness. The use of such predictive techniques in a formal licensing process to convince the responsible regulatory body that a repository at a specific site can be expected to meet regulatory requirements for a period of thousands of years may well be the most difficult aspect of demonstrating disposal technology. Many questions remain about how such techniques will be used in the licensing process.

Since such long term prediction has never been done in a formal regulatory process, we can anticipate that many unforeseen problems will occur the first time it is attempted. In addition, many analytic procedures to be used in the licensing process must be developed. These will include data collection and validation techniques, methods for verifying and validating mathematical models, and the protocols for using them to analyze repository performance.

A serious effort to resolve licensing uncertainties before the first formal licensing proceeding commences could avoid unnecessary delays at that critical stage of the waste disposal program. Thus, the resolution of those uncertainties could be one particularly important objective of an accelerated research, development and demonstration program.

Although the facilities contemplated in H. R. 1909 and the Test and Evaluation program would not be licensed, they could be used for testing the procedures and analytic techniques which would later be used in the licensing of repositories. For example, the Department of Energy could test the suitability of its site evaluation, facility development, and model validation procedures with respect to EPA and NRC requirements. The Nuclear Regulatory Commission could closely monitor the development of all facilities in order to improve its understanding of the repository development process, to provide useful information for the development of regulations for full-scale repositories, and in general to gain experience that would facilitate future licensing activities.

This effort could include a simulation of the entire licensing process at a small scale demonstration facility as a way of forcing early identification and resolution of the problems that could arise at each stage of the proposed repository licensing process. If waste is emplaced in such a facility, as proposed in H.R. 1909 and the Administration's program, licensing issues up to the decision to allow backfilling of a repository room could be explored. However, there could be significantly greater institutional obstacles to doing this at a facility that could become part of a permanent repository.

Expandable Facilities Versus Non-Expandable Facilities

The Administration's proposed Test and Evaluation facility is intended to be expandable into a permanent repository if the site proves acceptable, while H.R. 1909's demonstration facility is expressly prohibited from being made into a repository.

A principal argument in favor of allowing expansion of small scale test facilities into permanent repositories is that of cost savings. It is likely that tests and demonstrations in facilities that could not be expanded would increase the cost of the overall repository development program because of duplication of tests and construction activities which would have to be repeated at potential repositories.

A closely related argument made for allowing expansion of demonstration facilities is that it could avoid a diversion of effort from the repository development program that could slow down the process of obtaining a full-scale licensed repository. This argument is based on the concern that any requirement for near-term activities not directly in support of the repository development program will divert limited manpower and funds from the longer-term program and could thereby lead to delays, unless additional resources are provided.

A major potential advantage of the approach proposed in H.R. 1909, which explicitly forbids the expansion of the proposed demonstration facilities into a full scale repository, is that it may be able to avoid what is sometimes called the "foot in the door" problem - that is, the concern that unlicensed activities at a facility that could be expanded could lead to bureaucratic, budgetary, and political pressures for expansion. Fears that such pressures could compromise the integrity of the site selection process, or at least the appearance of integrity, could significantly limit the speed, scale, and flexibility of unlicensed activities at an expandable facility, as compared to one which could not become a repository. Such limitations could offset the expected cost savings of expandable facilities to some extent.

For example, it may be possible to select sites for temporary non-expandable facilities more quickly than for expandable facilities, because a slower, more deliberate selection process might be required for sites that could be used for permanent repositories in order to avoid premature commitments to sites. If useful generic information can in fact be obtained faster from facilities that are precluded from expansion, the earlier availability of such information may be worth the additional cost.

The scale of unlicensed activities at an expandable facility could be significantly limited in order to reduce concerns about the momentum generated by such activities, and its possible effects on the integrity of the licensing process. Such concerns would not apply to activities conducted at a facility that cannot be expanded. This could be particularly important if a demonstration facility were intended to be used for a "dry run" of the regulatory process all of the way through the emplacement of waste, the monitoring of repository performance, and the decision to backfill a room.

Finally, the flexibility of unlicensed activities could be considerably greater at a non-expandable facility, since there would not be concerns about their effects on the future licensability of the facility. In particular, the use of non-expandable facilities may avoid the requirement, now contemplated for expandable facilities, that any unlicensed activities be conducted within the framework of the NRC licensing process. This may allow closer cooperation between the Department of Energy and the Nuclear Regulatory Commission than would be possible at a facility that could become a licensed permanent repository, and might greatly facilitate the kind of simulation of the licensing process suggested earlier.

These potential advantages of non-expandable facilities probably cannot be realized as long as the "foot in the door" problem remains. That problem will remain unless there is credible assurance that the facility will not in fact be expanded. There are several ways to help provide such assurance. The first is a legislative prohibition on expansion of the facility, contained in H.R. 1909. However, because the Federal waste management program appears to be suffering from a significant credibility problem - in part because of repeated changes of policy in the past - this may not be sufficient to completely allay concerns, particularly if the proposed site or sites appear potentially suitable for repositories. This suggests an additional possible assurance, which is the deliberate selection of sites that appear relatively unattractive for use as permanent repositories. For example, one could use a site that is too small to be economically feasible for an operational repository. Alternatively, one could use a site that appears unattractive for permanent use in terms of regulatory criteria. For example, a site that is near to economically exploitable natural resources could be selected. Using such sites could increase the confidence that demonstration facilities would not be expanded into permanent repositories.

Research, Development, and Demonstration Plan

The last subject I would like to discuss is the potential value of a Research, Development, and Demonstration Plan in allaying concerns about the function of demonstration facilities. For example, some have questioned the desirability of demonstration or Test and Evaluation facilities unless their technical role in the repository development program is more clearly spelled out. Some are even concerned that construction of such facilities without clearly stated technical goals could reduce, rather than enhance, public confidence in the Federal waste management program.

These concerns could be addressed by requiring the Department of Energy to develop an integrated Research, Development and Demonstration plan which clearly identifies the questions which need to be answered for successful implementation of geologic disposal, and lays out a schedule for the activities needed to address these questions. Specifically, this plan would include a description of the research and development activities that will be conducted at demonstration or Test and Evaluation facilities to resolve specified technical uncertainties, and the role of such facilities in the repository development process.

In H.R. 1909, such a plan could be mandated simply by expanding the requirements for the program management plan specified in section 5 of the bill. Development of an integrated research, development, and demonstration plan that would have high credibility in the technical community could require more time than allowed in the bill for development of a management plan -- perhaps a year rather than the alloted six months. To the extent that a well-designed plan can make a demonstration program more supportive of the repository development program, however, this additional time could be made up by later savings. Perhaps more importantly, the development of such a plan would itself build confidence by providing strong early evidence of progress in the waste disposal program.

That concludes my prepared remarks. Thank you for the opportunity to come before the Committee today.

Mrs. BOUQUARD. Thank you.

Mr. Martin, please proceed with your testimony.

Mr. MARTIN. Thank you for this opportunity to present the views of the NRC staff on the bill to accelerate and provide direction to the Department of Energy's research, development, and technology demonstration program. I will begin by responding to your letter inviting my comments on the possible value and benefit of the activities proposed in this bill.

We anticipate the geologic repositories for permanent high-level waste disposal will be designed to accept many thousands of waste canisters over their operational life. This would entail a very large handling and emplacement operation involving the emplacement of waste packages at a very rapid rate.

The principal value of the R. & D. facility proposed in this bill, in our view, would be to aid the development and testing of such an emplacement system and would be useful to DOE in finalizing its repository design and materials-handling systems. Unless the facility were located at a site being characterized for the licensing of a repository, its value would be generic. Additional, detailed geologic information will still be needed for specific repository sites.

The value of the proposed R. & D. activities could be enhanced by co-locating it at one or more sites of different host geologic media undergoing characterization pursuant to the Commission's regulation in 10 CFR Part 60.

If the facility were then integrated into the site characterization program as described by Mr. Meyers, DOE could carry out some canister-handling tests with hot waste. The handling of such waste, for purposes of site characterization, without a license, is specifically authorized by the Commission's procedures for the licensing of geologic repositories.

I will briefly review these procedures to clarify their relationship to the activities proposed in H.R. 1909. Part 60 requires the characterization of at least three sites in two different geologic media, with excavation as necessary of shafts, lateral borings, and testing of the potential host geology at the depth proposed for disposal.

These activities may include the emplacement of radioactive materials, but our rules do not require it. Any such use of radioactive materials would be to provide the basic data on site suitability necessary for the preparation of a license application, and would therefore be unlicensed.

In order to enable such facilities to contribute most meaningfully to the national program for permanent disposal, we suggest that the bill be amended to require that the proposed R. & D. activities be performed only at sites undergoing characterization for licensed disposal, and be integrated into the site characterization program. We believe such an amendment would still be consistent with the Committee's technology development goals, yet contribute to the goal of achieving a licensed repository.

I would also like to offer our endorsement of your emphasis on engineered barriers in setting forth the purposes of the bill.

Because of the many uncertainties associated with the long-term performance of the host geology for a repository, especially during the initial period of high thermal stress from the decay of the fission products in the waste, the NRC staff feels it prudent to place considerable reliance on engineered systems. These features offer the advantages of providing a relatively higher degree of assurance in predicting their long-term performance, since they can be subjected to rigorous testing to permit further refinement of containment technology and provide the necesssary defense in depth.

We support your initiative in this area; however, we believe it will be necessary to consider the geologic features of the site as well. We're concerned that the bill as it stands could be read to indicate the geology is of little importance.

The language of the bill and the required design life for engineered systems could use some modification. It may be very difficult to implement a requirement that the design life of the engineered barriers be at least as long as the time needed for the health hazard of the wastes to become comparable to that of uranium ore. There is a wide degree of uncertainty inherent in establishing a benchmark based on this comparison.

Since ores vary in content and concentration, differing assumptions can be made about their hazard. And the comparison to geologically emplaced wastes does not account for the differences in geochemistry, hydrology, heat loading, and other safety-related factors.

This uncertainty has been compounded by the International Commission on Radiological Protection's recent document called ICRP 30, which revised the dose conversion factors in such a way as to extend the crossover point where the waste hazard becomes comparable to an ore body, to the order of many thousands of years.

In facing the problem of setting a time requirement ourselves on the life of the engineered package, we considered the approach outlined in the bill along with a number of others, and concluded it was best to pick a number rather than a concept, so that everyone knows what the design life is. We picked 1,000 years as the number to shoot for. It's based on the time required for the heat pulse from the wastes to peak out and return most of the way to ambient temperatures.

Should you desire to remain rather general in specifying the design life, we suggest that a good alternative would be the time needed for the thermal disequilibrium between the repository and the host rock itself to pass its peak and return most of the way towards the ambient temperatures in the surrounding geology.

In closing, I would like to make clear that while we see some purpose in the activities proposed in the bill, the primary purpose of DOE activities, in our view, should be to conclude the characterization of potential sites for a repository and complete a license application at the earliest feasible date. The activities proposed in this bill should not be permitted to interfere with this priority. They should be designed to complement it, if possible.

I hope, Madam Chairman, that you and your colleagues will find these remarks useful. I'd be pleased to take any questions you have.

Mrs. BOUQUARD. Thank you very much, Mr. Martin, for your testimony.

Mr. Meyers, on page 4 of your statement, it said the Department couldn't support the program proposed in this legislation.

I must say I can hardly believe that the Department has continued to be recalcitrant and unwilling to focus on any program we've had. We've had testimony, in at least two previous hearings, on this subject. It's largely, in fact the Department's unfocused approach that really makes this a waste of taxpayers' dollars.

I think it's really appropriate to redress this complaint in this year's DOE markup, prior to authorization. Instead of recommending constructive changes to the bill, I think you've really, clearly rejected the program and the bill. We'll follow up on this program with you, high level administration officials, and treat your comments and recommendations to improve upon this bill.

The Secretary has commented that the Department will move as quickly as possible to establish permanent storage sites for high level radioactive nuclear wastes.

What actions will be taken by the Department to accelerate the selection of these sites?

Are you developing any new earlier target dates?

Mr. MEYERS. If you recall, during the last administration there was a requirement to search out four to five possible sites. When each one was found suitable to be a repository, it would have been banked. At the end of a period of time, we would then select from those banked sites.

The current administration program is consistent with the NRC requirements of three sites. It's not necessary to bank the sites. That means we would have some flexibility of moving up the schedule; but it is still a long process to arrive at a suitable repository site, particularly if you factor in both the Department's desire and, I think, the Congress' intent to work closely with State and local governments in doing that.

It just takes time to make certain that all the people who need the information that we have, get it in a timely manner, have an opportunity to review the material, and get their comments back to us.

We think we can cut a couple of years off the previous schedule, but it's still an extremely long period of time.

Mrs. BOUQUARD. What role does the T. & E. facility have in meeting the administration's goals in establishing a permanent disposal site?

Is a T. & E. facility necessary to meet this goal?

Mr. MEYERS. We think that the test and evaluation facility—which, as I said in the testimony, the concept is similar to the demonstration facility you're talking about in the bill—would be very clearly of assistance in meeting the final goal of the repository.

But again, in our view, it has to be a viable option in terms of whether or not you later convert the T. & E. facility into a repository.

We would not want to preclude the use of this test and evaluation facility from later being converted into a repository. We would not say that we want to do it, or make a commitment; but it should be one of the alternative sites considered.

Mrs. BOUQUARD. Dr. Cotton, you called for an integrated R. & D. plan which does include the technology and demonstration facility.

Do you have such a plan, Mr. Meyers, or are you developing such a plan?

Mr. MEYERS. As you know, this concept of a test and evaluation facility was a requirement of the new administration.

Under the previous administration, we were developing what we were calling a national plan for radioactive waste management. We have yet to get instructions from the new administration as to how they want to proceed on the concept of a plan.

My own feelings are that we very definitely ought to have a recognizable, comprehensive plan that can be reviewed by all interested parties.

Mrs. BOUQUARD. For the record, does the Department totally reject the proposed approach in this legislation?

Mr. MEYERS. I offered words in the testimony to say that we cannot support the particular technology demonstration program, as outlined in the bill. We clearly have a commonality in that we both want to have a facility for test and evaluation and/or demonstration purposes; so we agree there.

But there are a number of features in the bill that we don't feel make sense. I've enumerated those.

So we don't reject the whole bill out of hand, but there are portions of it that we don't think make sense.

Mrs. BOUQUARD. Would you state the portions that you think don't make sense?

Mr. MEYERS. The idea of excluding the facility from being used as a repository, at a later date. That's one.

Second—and this was not covered in the testimony—the requirement that the facility run to the year 2005—or up to the year 2005. I don't think there ought to be a date in the bill, as to how long such a test facility would run. You use it as long as you need it.

Mrs. BOUQUARD. This could be extended, at the discretion of the Secretary.

Mr. MEYERS. That's true, but a date tends to focus people's attention. You really shouldn't proceed with the operation of a repository until you've finished the work in the test facility or demonstration facility. It just doesn't seem to me to be necessary to have such a date in there.

Those are two areas that I can recall off hand. Let me check the testimony, and see which others——

Mrs. BOUQUARD. But, Mr. Meyers, do I understand that these are political in nature—these issues are political in nature, that you've addressed yourself to?

Mr. MEYERS. Not necessarily.

The time period for which a facility should run, I think, is a technical issue; and rather than put a time in the bill, as to how long such a facility ought to be run, it would seem to me that the mandate ought to be that you run the facility for as long as it's useful, whatever duration that may be.

Mrs. BOUQUARD. Within the scope of this legislation——

Mr. OTTINGER. Would the gentlelady yield?

Mrs. BOUQUARD. Yes.

Mr. OTTINGER. Is legislation needed, in your opinion, to proceed with the test and evaluation program?

Mr. MEYERS. It would be helpful, but in the authorization and appropriation processes, we would identify such a test and evaluation facility as a line construction item. If we go by that particular route, we'd have the necessary authority.

Mr. **Ottinger**. I thank the lady for yielding.

Mr. **Goldwater**. Would you clarify what you just said? You said, in the "authorization or appropriation process."

Are you talking past or present?

Mr. **Meyers**. Future, essentially, since we just recently developed the concept of the facility.

Mr. **Goldwater**. In other words, you have a concept, but you don't have authorization to do it?

That's the question, I think, that you were talking about.

Mr. **Meyers**. What I'm saying is that our time schedule is such that the site that we would select for a test and evaluation facility wouldn't be decided upon until 1985; and it will be selected from those sites that we are now looking at for a full-scale repository.

So, in future budget years, when we're deciding which particular site ought to be the test and evaluation facility, we would propose, as a line construction item, that that facility be built. That would be authorized, and moneys appropriated for it.

Mr. **Goldwater**. So the answer to the question is yes?

Mrs. **Bouquard**. It's a line item in the 1982 authorization bill.

I'm going to come back to my questions later. The rules of the committee do require that the Chair recognize members for questions, in the order in which they appeared at the hearing. We will proceed as follows: Mr. Lundine, Mr. Lujan, Mr. Wolpe, Mr. Ottinger, Mr. Goldwater, and Mr. Lowery.

Mr. Lundine?

Mr. **Lundine**. It's your view that by taking the approach that you've outlined, that the Department wishes to take, that you'll actually get to a permanent repository on a faster time schedule than if we take the research and demonstration aspect, apart from the other elements of a comprehensive program? Is that right?

Mr. **Meyers**. We feel that the test and evaluation facility should certainly be integrated with the search for a repository. I think the testimony made that clear. To do whatever work you feel is necessary for the test and evaluation facility without having the ability to later convert that particular facility to a repository, just doesn't make sense.

Mr. **Lundine**. It couldn't be a waste of money, could it, then?

Mr. **Meyers**. I wouldn't call it a waste of money, in the sense that it's always desirable to get as much information as one can.

Mr. **Lundine**. Let me put that differently. It could cost more money than taking an integrated approach?

Mr. **Meyers**. Clearly. Let's say we have that test and evaluation facility in operation in 1989, and, at the same time, we're working that particular site and the other two, in terms of selection for a repository to go to NRC with for a license application. If it turned out that the test and evaluation facility site was the one that you went with to NRC for the license, you would have saved a good deal of money. But if you picked another site, then you would not have.

Mr. **Lundine**. Right. So, your approach, not precluding—I don't care whether we call it test or demonstration facility—from being part of a permanent site, has the potential of saving considerable tax dollars?

Mr. MEYERS. That's correct.

Mr. LUNDINE. And possibly getting at the eventual goal of having a licensed repository somewhat sooner?

Mr. MEYERS. Possibly. In large measure, that would be the social and political kind of thing where, by virtue of being able to see what we've done already, we might be able to convince the various citizens that we really do know what we're doing.

Mr. LUNDINE. I know you're going to be reluctant to give me an estimate, but roughly how much money are we talking about for the kind of demonstration facilities that are contemplated in H.R. 1909?

Mr. MEYERS. We haven't priced that out, but we did get a quick, rough estimate for the test and evaluation facility that we are talking about, which would be substantially larger than the one that you have. The bill called for a facility to have up to 40 cannisters of waste; we're talking about a facility to have between 200 and 300.

That particular facility would be on the order of $200 million to $300 million.

Mr. LUNDINE. The bill calls for three facilities.

Mr. MEYERS. Two.

Mr. GOLDWATER. Of 40. Is that right?

Mr. MEYERS. That's right.

Mr. LUNDINE. So you wouldn't have any idea what we're talking about?

Mr. MEYERS. Approximately the same.

Mr. LUNDINE. $100 million up, or something?

Mr. LUJAN. If the gentleman would yield. They've already spent $100 million, and they haven't turned a spade.

Mr. MEYERS. Two weeks ago——

Mr. LUNDINE. I'm asking the question, with due consideration that these may not be accurate figures. I'm just trying to get some idea of the ball park.

Mr. MEYERS. Congressman, the money spent on WIPP was essentially to characterize the site. That site is as fully characterized as we can make it. It just points out what I said earlier about it being an expensive and lengthy proposition to find a suitable site.

But completely aside from the money one spends, the process you go through to find a site for a demonstration facility—in order to demonstrate credibility, we'd have to very nearly replicate a site that we'd use for a repository. And after having gone through that exercise, it just doesn't make sense to me, from an engineering point of view, to automatically just start it over again.

All we're saying is that it ought to be retained as a possible option. Not that we're making a commitment to use it, but it ought to be in the running.

Mr. LUNDINE. In that connection, you are committed, even with respect to a test facility, to consultation and coordination with State and local governments. Is that correct?

Mr. MEYERS. Absolutely. That is fully part of the Department's program. Those States that we're working in are well aware of our presence. We've been accused, by some of the States in the Appalachian region, of just hounding them to work with us. We refuse to do anything in a State until the State officials have designated people for us to work with. Where they haven't, we haven't done anything yet.

Mr. LUNDINE. I'd like to ask one question to any of the witnesses who would care to respond. I was going to address it to Dr. Cotton, but I guess it would be just as appropriate for any of the witnesses.

Do you see any value, above this question of a demonstration facility, of possibly considering a licensed intermediate-scale repository?

Mr. MEYERS. I'll take a crack at it.

One of the reasons for the approach we're taking is that we think we can do it quicker if it's not licensed. As Mr. Martin said earlier, there are current regulations that provide for us to do this sort of activity in consultation with them.

If you make it a requirement that the test and evaluation facility, the research and development facility, or the demonstration facility be licensed, then, completely aside from the precedent that it sets with regard to the licensing of Department research and development facilities, I don't see what additional benefits you gain, since we're clearly committed to licensing a full scale repository, and going through the procedures that the NRC regulations require—the hearings, the boards, and the whole regulatory process.

To saddle the research and development or a test and evaluation facility with that kind of requirement, in my mind, is not good public administration.

Dr. COTTON. I'd like to add to Mr. Meyers' comments.

In the course of our study, we considered a licensed intermediate scale repository as one possible way to obtain some experience more rapidly than waiting for the licensing of a full-scale repository. The reaction that we received from our own advisory panel and others we discussed it with was essentially similar to what Mr. Meyers has stated. That is: If you require the formal licensing process, it's going to take as long to license an intermediate scale facility as a full-scale one.

In other words, limiting the scale of the repository may not speed up the licensing process significantly, so you wouldn't be able to get the benefits of earlier experience.

The question of whether you can get information and experience more rapidly through test and evaluation facilities or freestanding, nonexpandable facilities should be given careful consideration.

If you try to get experience using a facility that will be expandable or can be converted into a repository, there may be limits on how rapidly one can do it; and it might be less difficult politically with facilities that would be precluded from expansion. Of course, that's a hypothesis. It's not clear that it would be possible to save much time by using nonexpandable facilities; the problems may be too severe. However, if it is possible to move more quickly with a nonexpandable facility, then one just has to make a value judgment as to whether the benefits of getting information more rapidly are worth the additional costs of such an approach.

Mr. LUNDINE. Mr. Martin, I was intrigued by Mr. Meyers' comment that they would work in consultation with the NRC in the test and evaluation facility.

You are prepared, I gather, to be consulted and to be actively interested in a test or demonstration facility, whether there are any procedures for licensing or not. Is that correct?

Mr. MARTIN. That's right, Mr. Lundine.

I'd also like to take a crack at this previous question about the intermediate scope facility. Maybe that will help answer this question, as well.

You know, back when the interagency review group conceived this idea of an intermediate scale facility, I think part of the thinking there was that there was no way to get underground to do testing and even place some waste, under the current rules that we're operating under, short of having some kind of licensed facility.

In the last 2 or 3 years, the Commission has thought through this problem, and has concluded that we do not want to proceed ahead with licensing on the basis of speculation.

We really want some facts and some research, so that we can bring the procedure to a conclusion. So, we've developed procedures which are now effective rules that not only permit, but require, a considerable amount of underground exploration and testing at several sites, which can include—in it's contributing to site suitability—the sorts of test facilities that we're talking about here, as a prerequisite to submitting a license application.

So, I think that the concept of the intermediate scale facility has, I think, seen its day.

Our procedures also provide very clear NRC involvement in the site characterization stage, and provide for State and local involvement on a consultative, opinion-type basis.

But since the purpose of the work is to gather information to support a license application, it is unemcumbered with the licensing.

Mrs. BOUQUARD. Thank you very much, Mr. Lundine.

Mr. Lujan.

Mr. LUJAN. Thank you very much, Madam Chairman.

It seems like we're all heading in the same direction. We all want to demonstrate the technology and get to the point where we have a repository. DOE wants to do it slower than in the legislation. I guess that's what really prompted the legislation. It puts time frames in there, and, as a matter of fact, the findings are to demonstrate the availability of technically verified methods for safe disposal and provides direction to the Secretary of Energy in research and development to confirm the existence of technological solutions for disposing of high level waste. Then it goes on and sets some dates.

We were discussing the 180 days for identification of sites. It seems to me, and I've thought this for years, that it's going to end up in Nevada and in Washington. You have made those selections already in effect. The fact that it says it shall not become a permanent repository is simply in there to keep away from licensing. We don't want to get mixed up with NRC while we're moving ahead with this thing. And it concerns us that the Department moves too slowly with it. We hear testimony that all of the technology is there. Now we've got to make the political decisions. That's what everybody keeps telling us. All of the witnesses. Is that correct or incorrect?

Mr. MEYERS. The technology is either here or being developed. I'm sure you're well aware, based upon the activities in your State on WIPP, that we are not talking about a simple process. The dates that we have come up with are predicated on several factors. One is just technically gathering the information.

On the WIPP site in New Mexico, for example, we have no difficulty collecting the data. There is no opposition to collection of the data. And that took an extended period of time.

Mr. LUJAN. You mean the data characterization of the site?

Mr. MEYERS. Right. That's been going on for 8 or 9 years. The aspect of collection of technical data just takes time, and you cannot cut that short by putting a date in the law, as you well know. If you put a date in the law, and we miss it, we can be sued by somebody for missing the date and the Secretary ends up before a judge explaining why he missed it, and gets another date from the judge.

I mean I don't object to the dates, because it gives us a target to shoot for. But then the social/political concerns are very real—I should have introduced this by saying we have not decided to put it in Nevada or Washington—very definitely not.

Mr. LUJAN. That's the only thing that makes sense. [Laughter.]

Mr. MEYERS. From your point of view, maybe. [Laughter.]

We're looking at various sites. There's one in Nevada, there's one in Washington, and there will be a site in Mississippi, Louisiana, Texas, or Utah. So we have not gone through the analysis yet that says either where the test and evaluation facility will be or where the repository will be. There is speculation that it will be in Nevada or Washington.

Each time we speak with the elected officials of those States, they say the same thing. You know, you've made up your mind it's going to be here. And we can't have made up our mind about all three places, but each of the officials of those States have that feeling. You know, when you're looking at things very broadly, people don't get overly concerned. It's only been recently that we've narrowed down the salt domes in the gulf coast from 8 to 4, and the recommendations said one looks better than the other. So we've been taking all sorts of flack from that.

In my view, the Department's obligation is to do the best technical job it can. At some point in time, we're going to come before the Congress and say: "We recommend this. This is it." I'm not quite sure how it's going to come out—if it will be the State of Washington or the State of Nevada, or whatever other State it may be. I doubt if they are going to be standing there with open arms.

Mr. LUJAN. What will probably happen is that the guys from a particular State are going to vote no and everybody else is going to vote yes, and we're going to put it there. That leaves me out. That's probably what will happen. Let me get on to the requirements of how long it's got to be engineered for.

NRC is saying 1,000 years.

Mr. MARTIN. Yes, as far as the engineering package goes. We looked at all of the different curves. In fact, last year we talked about this when discussiong 7418 as to when does the repository become equal to the ore body. So we've looked at that and the thermal problems and concluded that about 1,000 years is the right number to design the waste package for.

Mr. LUJAN. It was my understanding that if you used reprocessed waste that the elements have a half life of 300 years.

Mr. MARTIN. That's not true. It depends, for example, on the fuel cycle with the plutonium recycle waste where you constantly recycle the fuel, there are a lot of transuranic wastes, americium, curium, and a number of long-lived wastes. So it's much longer than 300 years.

If it's uranium recycle only, which no one is talking about for recycling, then it may be closer to the 300 years. But if you look at the types of reprocessed waste for a breeder or plutonium recycle, it's out in the 1,000-year, 1,500-year period.

Mr. LUJAN. Has DOE got the technology to be able to isolate and control all of those things that he's talking about for 1,000 years?

Mr. MEYERS. That is a bone of contention that we do have with the NRC. From a technical point of view, I think we can design a package to last 1,000 years. The question is, is it going to be worth it.

Our argument to NRC was that one ought to be concerned about the whole system and be obliged to meet performance standards on the whole system rather than individual portions of it. The regulation was passed a couple of days ago by the Commission in proposed form, and we will offer our technical comments to the Commission to try to dissuade them.

Mr. LUJAN. Thank you, Madam Chairman.

Mr. MEYERS. But technically you can build a package to meet the 1,000 years criterion.

Mr. GOLDWATER. Would the gentleman yield?

Dr. Meyers, what you're saying then is that you'd rather have the NRC just establish a period of time, without telling you how to arrive at it?

Mr. MEYERS. Not necessarily a period of time. But if you're going to talk about release rates in the packages and specify the release rate of 1 part per 100,000 per year, we feel that instead of limiting it to the waste package or the waste form in the engineered barriers, it ought to be the entire repository that meets the restrictions.

What we're concerned about is keeping the material in the ground for a sufficiently long period of time so that it either never reaches the biosphere or that by the time it does, it is innocuous. We feel that we ought to be concerned about the whole system. The whole system is the waste form, the canister that holds it, the overpack material, and the geologic environment surrounding it all.

Mr. GOLDWATER. What are you saying then about the NRC? Are you saying that their standards are strictly on package or geology?

Mr. MEYERS. Their standards cover everything except that they do have a requirement of how long the package itself should last, and the release rates associated with it. We felt that we had difficulty with that.

Mr. LUJAN. You mean the canister should have a life of 1,000 years. Is that what you're saying?

Mr. MEYERS. That's right.

Mr. GOLDWATER. And you're saying that the approach should be that if it's 1,000 years or 10,000 years, that there ought to be enough flexibility in there to allow you to meet that standard by looking at the total system, not just each individual incremental part of it.

Mr. MEYERS. That's right.

Mr. LUJAN. I have a suggestion. We have a house in Santa Fe that's 1,000 years old made out of adobe. Maybe you could put it there.

Mr. MARTIN. As a matter of fact, that's one of the more promising concepts being looked at at Sandia. The idea is to use a certain natural clay backfills around these canisters in a very effective way to capture the radioactivity essentially for thousands of years. So that's really not all that far off.

Mr. MEYERS. In that concept—and we know the pyramids have been around for 3,000 years—you take the package and wrap it in some New Mexico adobe.

Mr. LUJAN. There you go.

Mrs. BOUQUARD. Mr. Wolpe.

Mr. WOLPE. Thank you, Madam Chairman. I'd like to just pursue this question for a moment. I take it while there may be some quarrel between DOE and NRC with respect to a 1,000 standard for the engineering barrier. Is there any dispute with the goal of a 10,000-year target for the standard that is necessary to provide safety?

Mr. MARTIN. Let me answer that. The overall figure of merit for the whole repository, in other words, how much release over that 10,000 years, is to be established by EPA. They have not done this. We've been expecting it every week now for the last 2½ years, and we haven't seen it yet. But I think we ought to know what they're working on. They have a list of allowable releases over a 10,000-year time period that I believe we're both working to in the absence of nothing else. But that has not been issued.

Mr. WOLPE. The 10,000 years would be that we have to isolate these materials for a 10,000 year period?

Mr. MARTIN. That's what EPA is thinking about.

Mr. WOLPE. Mr. Martin, if there were a provision in the legislation for a facility to become a permanent repository, that it could be transferred to become a permanent repository, what would be the NRC's position at that point? Would you, at that stage, ask for licensing of that repository if it was still in the test and evaluation mode?

Mr. MARTIN. Well, I covered that somewhat in the testimony. We feel that such a facility would be acceptable, if it were integrated into the unlicensed site characterization program. As I said, we require at-depth testing, and even permit using radioactive material if it's reasonably related to characterizing the site.

If the test and evaluation work were done and integrated into that program, and contributed to characterizing the site, contributed to data necessary to make the case for the license application, that could be done on an unlicensed basis as part of site characterization.

Mr. WOLPE. So that the argument that this becomes a permanent repository or the moment we build into this legislation the possibility of this being converted to a permanent repository, that that opens up the licensing question is not a valid proposition, is that correct, from NRC's standpoint?

Mr. **Martin**. No.

Mr. **Wolpe**. It would not do that from an NRC standpoint? I must say I have some questions about that. I just want to make sure I understand what the NRC position is.

Mr. **Martin**. Again, I must say that the activities have to be reasonably related to characterizing the site. If they get out of hand and aren't related to characterizing of the site, then it would be licensed.

Mr. **Wolpe**. I guess I'm a little bit puzzled. I understand Mr. Meyers indicated that from the standpoint of good public administration it did not make sense to propose the licensing procedures at this particular phase of the work until the final repository had passed the test and evaluation phase.

I'm not sure I understand that because on the other hand I think you also hear Mr. Meyers saying that we ought to try to build in a permanent capability. I would think from a public relations standpoint, if not from a public administration standpoint, it would make some sense to try to provide maximum assurance to the public that this location has met all of the possible concerns that people might have with respect to a long term disposal of waste.

Mr. Meyers, would you care to respond?

Mr. **Meyers**. As an engineer and as a taxpayer, I would recommend to our management that if we were obliged to license a test and evaluation facility, we not have them and just proceed with the repository.

Mr. **Wolpe**. Why?

Mr. **Meyers**. You're injecting the regulatory process, which is extremely time consuming, and it puts you in a framework of opposition and antagonism from people who just want to object to everything you want to do. As Mr. Martin has said, the purpose of the facility is to get more data and more information that will allow us to do a better job on the licensed repository, and if you have to go through the same rigorous regulatory procedure to get that information in the first instance, the value of it seems to disappear. I think that's what the advisers to the Office of Technology Assessment concluded as well.

Mr. **Martin**. I would elaborate on that. That was very much in our mind when we came up with our part 60 effective rule. In order to determine whether we should license the repository one needs a considerable amount of information to deal with the questions on a factual basis. If one were to license the activity one needs to gather the data to find out if it's a suitable site. We would just never get there.

Mr. **Wolpe**. The broader concern then, and maybe part 60 regulations cover this concern, is that even a test and evaluation facility will involve the placement of highly radioactive waste materials. That could conceivably pose a serious danger to the environment, to the area surrounding the facility. I guess the question is how do we provide a maximum degree of public assurance that it has indeed been sufficient?

Mr. **Martin**. What part 60 requires is that the Department submit to us a plan for their work underground, and that NRC would review this plan and notice it publicly and the public comment on the plan. Also there's provision for the State people to work with us on assessing this plan. We would give the Department an advisory opinion, which again we would hope they would follow, which would provide a sort of intermediate control of the thing. It's not mandatory, but it would seem to me that they would be pretty well bound to follow it as a way of keeping a reasonable amount of control on an activity that is essentially information gathering, and I would expect, if we're talking a few dozen canisters, 40 to 100, something like that, that it's very unlikely that anything could go wrong in the short term, which would be a public health hazard.

Mr. **Meyers**. May I elaborate on that for a minute? I'd like to make the point that it is to our advantage to work closely with NRC on this particular facility, because if we proceed and ignore their recommendations and comments, we jeopardize the ability of that particular test facility to later be in the running as a full scale repository. I just don't envision any situation where, if they say that we ought to do something a little differently, that we would ignore it.

Mr. **Wolpe**. Mr. Meyers, what is your reaction to the absence of any provision for spent fuel burial in the test evaluation facility?

Mr. **Meyers**. Well, as you know, the new administration is rethinking the no-reprocessing policy. It's certainly conceivable that the problem having to do with spent fuel management could disappear if commercial reprocessing comes back on the scene. If it does not, then you're faced with either storing spent fuel for some extended period of time, or, if the utilities or Federal Government say that certain categories of spent fuel are a waste, you would then have to dispose of spent fuel.

Mr. **Wolpe**. Is there any advantage to not providing for the burial of spent fuel within this facility?

Mr. **Meyers**. Not particularly. What you want to do is have a facility that allows you to treat highly radioactive material. Solidified high-level waste is highly radioactive. Spent fuel is highly radioactive. The geologic media doesn't know from whence the radiation comes.

Mr. **Wolpe**. The industry representative yesterday indicated that there might be some advantages to providing for the burial of spent fuel as well.

Mr. **Meyers**. If you're talking about the full scale repository, that may indeed be necessary.

Mr. **Wolpe**. He was referring to the test facility.

Mr. **Meyers**. At the test and evaluation facility itself what you need to get into the ground are highly radioactive materials. It could either be spent fuel or solidified high-level waste.

Mr. **Goldwater**. Would the gentleman yield at that point?

Mr. **Wolpe**. I'd be pleased to yield.

Mr. **Goldwater**. So then you have to ask the question does it make sense to bury spent fuel.

Mr. **Ottinger**. Just from the standpoint of this test and evaluation facility, I think the testimony yesterday was that there weren't enough canisters around to be able to complete this, and therefore the limitation should not be on the legislation.

Mr. **Meyers**. Well, this bill does indeed provide for constructing a solidification facility. One would have to construct one in any case. It's conceivable under the time schedule we're talking about that waste from West Valley, for example, could be solidified and made available to this facility.

Remember, a test facility is a retrievable operation. If they had spent fuel in there, because that's all we could get to check the characteristics of radiation and heat, then at some point in time, if the decision were to reprocess all that material, we could take it out.

Mr. **Wolpe**. Let me ask—let me yield further to the gentleman here.

Mr. **Ottinger**. I have to leave. I wonder if I might ask a few questions.

Mrs. **Bouquard**. You follow Mr. Wolpe.

Mr. **Ottinger**. Go ahead.

Mr. **Wolpe**. One last question, then I will yield to the gentleman.

The 180-day provision, I'd like to just get the reaction of Mr. Meyers and Mr. Martin to that. Is the 180-day provision reasonable? Or do we need a longer period of time in which to identify it?

Mr. **Martin**. It's unreasonable.

Mr. **Wolpe**. Thank you. Mr. Meyers?

Mr. **Meyers**. It's unreasonable.

Mr. **Wolpe**. Thank you. Mr. Martin, do you have any comment?

Mr. **Martin**. I think if it's integrated into the site characterization program, it's not necessary.

Mrs. **Bouquard**. Mr. Meyers, what we're talking about in the 6-months timeframe is not drilling any holes. What we're talking about is looking at sites that we think would be appropriate in a 6-months timeframe. Surely, the sites that we have discussed——

Mr. **Meyers**. Without selecting?

Mrs. **Bouquard**. If you go back to the legislation.

Mr. **Meyers**. Sorry. Yes, we did already state in our testimony here that there are three areas that we can pretty much identify—two areas we can identify now, not very site-specific, but the various locations, the Hanford reservation and the Nevada test site.

Mrs. **Bouquard**. You say these sites have to be identified. That's all this legislation provides for.

Mr. **Lundine**. Would the gentleman yield for a minute?

In other words, what you're saying, so that we understand it, is that you would not feel comfortable in identifying sites, that is, to say, "These are the sites," within a 6-month timeframe; correct?

Mr. **Meyers**. I'll tell you why.

Mr. **Lundine**. First tell me that I'm correct. [Laughter.]

Mr. **Meyers**. Yes, you're correct. The reason for it is that in order to actually pick sites, we have to go through an environmental impact statement analysis, and I think if we just said, "These are the sites," we'd be subject to litigation and a good deal of criticism.

Mr. **Lundine**. I thank the gentleman for yielding.

Mr. **Wolpe**. The last, last question that I have——

[Laughter.]

Mr. WOLPE. May I ask the gentleman from California to respond to this: If we were to expand the provisions of this legislation to encompass the possibility of a permanent repository also being established at the site that's been identified for the test evaluation facility, would that create a different jurisdictional question? Would that then automatically open up the jurisdiction to the Interior Committee?

Mr. GOLDWATER. I believe that's the problem.

Mr. WOLPE. In other words, this language has been drafted completely to get around the jurisdictional problem?

Mr. GOLDWATER. Not simply, but that is a consideration.

Mr. WOLPE. I thought so. Thank you.

Mr. GOLDWATER. I think it's quite clear, because we have been working on this package, on some kind of program, for many, many years, and it always gets hung up on political kinds of battle.

This kind of effort was to simplify this thing, and to stop, in essence, the paper studies and start demonstrating the technology that has been advanced, so that we can have this learning curve, so that we can go to licensing, so we can go to all kinds of participation that is called for in a full program.

It was sort of an interim step to get us to where everybody has mentioned they want to go. A very logical step. But there was a political element involved.

Mr. WOLPE. I appreciate your candor, and your intent. I think it's important, though, that we take into consideration the possibly much greater costs that might be incurred as a result of that approach.

Mrs. BOUQUARD. Would the gentleman yield to me?

Mr. WOLPE. I would be pleased to yield to my chairman.

Mrs. BOUQUARD. I'd be certainly happy to work with you in any way possible when this legislation reaches the floor. If you would like to expand upon it, to broaden the scope of this program, I would be happy to work in that direction.

Mr. WOLPE. That might be the answer.

Mrs. BOUQUARD. This legislation falls within the responsibility of this committee.

Mr. Ottinger?

Mr. OTTINGER. Thank you, Madam Chairman. The bill requires, as you just noted, the Secretary is directed to design and construct and operate a waste solidification facility.

A couple of questions. One, can you use spent fuel to adequately complete your tests? So what is the need for a solidification facility in order to complete this test, and what would it cost?

Mr. MEYERS. Well, remember—and we mentioned this at hearings we held a couple of days ago—one of the benefits we expect to get out of this facility is to be able to emplace actual waste, actual packages, and actual engineered barriers. Now, if it turns out that the country makes the decision to dispose of spent fuel, that would be part of the program.

As you well know, there's an awful lot of liquid waste that needs to be solidified around this country. I think we'd have to show the Congress, as well as the public at large, that we cannot only solidify the waste, but that we can put it in a container that has integrity, that we can provide the necessary engineered barriers to assure that if, magically, the container is ruptured, and, magically, water finds its way to the canister, that the material will not reach the environment.

Mr. OTTINGER. The actual solidification is presently being done on a research basis at Hanford.

Mr. MEYERS. On a very, very small scale. This country has solidified some radioactive wastes. That would be one of the sites that we'd look at to see if the existing facility can be modified to accomplish the purposes of this act.

But we have not done a lot of it. Most of the waste that has been solidified has been a replica of waste.

Mr. OTTINGER. What is the cost of the design, construction, and operation of a solidification facility?

Mr. MEYERS. I can't give you an answer, because it depends upon the size of the facility.

Mr. OTTINGER. A facility that would be contemplated in connection, I guess, with your tests and evaluations.

Mr. MEYERS. We have not done a cost estimate. We have not designed such a facility. And I would be reluctant to just pluck a number out of the sky, since it then comes back and haunts me.

Mr. OTTINGER. You don't even have a ballpark figure?

Mr. MEYERS. We haven't done a design——

Mr. OTTINGER. How long would that take?

Mr. MEYERS. The design?

Mr. OTTINGER. The design, construction.

Mr. MEYERS. For the purposes of getting a decent cost estimate, you'd have to have a good conceptual design. We could probably do a good conceptual design of such a facility in about 8 months.

Mr. OTTINGER. And the construction?

Mr. MEYERS. About a year and a half.

Mr. OTTINGER. About a year and a half. When you gave us, in our committee, a ballpark estimate of $200 million of the test and evaluation program, did that include solidification?

Mr. MEYERS. It's just for the repository aspects of it.

Mr. OTTINGER. Just for the repository aspects of this. The solidification would cost more.

Mr. MEYERS. That's right. And we don't have an estimate for that.

Mr. OTTINGER. Mr. Martin, Dr. Hendrie testified before Energy and Power during the last Congress that there was no need to lower hot fuel or canisters into a hole in order to be able to characterize the site. What's the NRC's position on that? He said all the materials handling and packaging and everything else would be done on a generic basis; there's no particular advantage to lowering it into a site.

If you're worried about heat, you can use some kind of a heat source other than uranium fuel to test the heat characteristics at a given geological site.

Mr. MARTIN. Let me answer that. I think the answer is basically yes, the position remains the same. For purposes of characterizing the geologic performance of the site, one does not need a facility like this; in fact, it might even interfere with getting the data one needs.

However, as a follow-on step, if you consider that a repository would probably require the emplacement of up to one package an hour, there could be a great deal learned by doing some work like this on the suitability of the site to accommodate it. Perhaps the rock type is such that it's too hard to find, and too hard to work with to achieve that sort of production rate.

So in that sense, a facility like this could be of some use in determining the use of the site, but it should not interfere with the first step, which is what Dr. Hendrie was talking about. Indeed, you don't need a facility like this to determine the suitability.

Mr. MEYERS. Mr. Ottinger, can I go back to your previous question on the solidification facility? The schedule of the West Valley project is such that that waste could be available for this facility.

Mr. OTTINGER. Will that produce 40 canisters?

Mr. MEYERS. As far as this bill goes, it will, indeed. I think it will produce several hundred canisters total. Also, the current schedule for the defense waste processing facility at Savannah River is such that solidified waste from that facility would be available. So it may not be necessary to have a separate solidification facility to provide feed material for either of the proposed two demonstration projects that you have outlined in the bill or our test and evaluation facility.

Mr. OTTINGER. Should, then, the requirement that there be a solidification facility built in connection with this facility be eliminated from the bill?

Mr. MARTIN. I would leave it in.

Mr. OTTINGER. As a requirement?

Mr. MARTIN. So that we have authorization for something. You're talking about a West Valley project and a defense waste processing facility. We have schedules that may or may not materialize, but the current schedules are such that it could be available.

Mr. OTTINGER. Mr. Berick, representing the environmental organizations yesterday, said, and I'm quoting: "The uranium ore standard in the bill represents a completely ambiguous and unacceptable performance standard. Not only is there a vast range of uranium ore grades being exploited, but uranium ore in general constitutes a significant health hazard."

The U.S. Environmental Protection Agency has estimated the potential risk from a generic ore body to the U.S. population as 1,000 cancers per year. Mr. Meyers, do you accept the uranium ore standard that exists in this bill?

Mr. MEYERS. As Mr. Martin has said earlier, ore bodies vary. It's not a precise measurement. I forgot what Mr. Martin suggested.

Mr. OTTINGER. He suggested it be replaced. I wanted to get the Department's position on that.

Mr. MEYERS. I myself have not focused on that aspect of it.

Mr. OTTINGER. Can you supply that for the record?

[The information follows:]

The Department of Energy feels it would be inappropriate to use a uranium ore body as a standard of performance for a nulcear waste repository for two reasons: first, there is great variation from one ore body to another, and, secondly, there are considerable uncertainties in estimating the hazards of an ore body.

Mr. OTTINGER. Mr. Martin, is this statement that I just read accurate?

Mr. MEYERS. That Mr. Berick made?

Mr. OTTINGER. Yes. Does the uranium ore standard of the kind put in here present a health and safety hazard?

Mr. MARTIN. It represents what exists in nature, and what health effect the uranium ore bodies in nature have is subject to a great deal of speculation. EPA's estimates vary all the way from very large numbers to very small numbers. We really don't know for sure.

Mr. OTTINGER. What does the NRC recommend as the standard for waste repositories in terms of radionuclides?

Mr. MARTIN. Our recommendation, as I said, for the canister, the waste package, is to design it to release nothing for at least 1000 years, and a very, very small amount thereafter. And the Commission just this week approved issuing that for public comment.

Mr. OTTINGER. So a test which did not meet your standard would be of limited utility, wouldn't it, unless it's designed to produce actual information on the ultimate waste repository?

Mr. MARTIN. This facility, the DOE T. & E. facility, would probably not contribute much to understanding of the canisters. That's something that has to be worked out in the laboratory.

Mr. GOLDWATER. Will the gentleman yield on that question?

Mr. OTTINGER. I'll be glad to.

Mr. GOLDWATER. Mr. Martin, have we done enough work in this area to really say what is the best approach? I know the NRC has taken a position that somehow this should peak and come back to temperatures—or to the conditions, of the surrounding media, versus the original ore body, as contained in the bill.

At this point in time, do we really know enough? And can we, with this kind of program, really define what is the best standard?

Mr. MARTIN. I think in a bill like this, it's our view that it's usually best not to quote precise technical acceptance criteria in a bill, but instead, indicate where you would like to go.

The uranium ore standard, a year ago I would have thought was probably a pretty good standard. But since then, as I said, the International Committee on Radiation Protection has changed some of the dose estimators, so that the curves we have probably all seen that show the ore body crossing over in a few hundred years just aren't that way any more.

And a better standard would probably be the time at which the thermal disequilibrium between the repository and the host rock reaches pretty low values.

Mr. GOLDWATER. I think the question, then, has to be directed at the Department of Energy. The NRC basically puts a time element on these repositories. Is that satisfactory to the Department of Energy? Or are you more interested in something concerning the design characteristics instead of the specific time factor?

Mr. MEYERS. We agree with the concept of thermal equilibrium as being the important time that you have to worry about. But in terms of a release rate to the environment, that's where we differ. We think the release rate to the environment ought to be for the whole system, as opposed to the canister. But we do agree with the concept of reaching thermal equilibrium as the criterion.

Mr. GOLDWATER. That would be preferable to the ore body?

Mr. OTTINGER. That's one of the things—excuse me—about not having the NRC formally involved in this process. Since they are the folks who are designated by Congress to protect the public health and safety.

Mrs. BOUQUARD. Would the gentleman yield?

DOE has in their charter that they're required to take care of the health and safety in all R. & D. facilities. This is their responsibility. It is not the responsibility of the NRC.

Mr. MEYERS. Also, Mr. Ottinger, the concept that you are alluding to is for the long term. Thermal equilibrium is for several hundred years. We're talking about running the facility in the near term.

While it's true that we are responsible for health and safety, again, the licensed repository will have the NRC involved in their full regimen of regulatory activities, in the phase having to do with the test and evaluation facility, DOE certainly has the capability and experience, and I think a proven track record, to operate facilities like this safely.

I have got to repeat what I said earlier, both at your hearing and here today, that it is not to our advantage or the country's advantage for the Department of Energy to ignore comments regarding health and safety that we would solicit from the NRC, because if we do ignore them, we jeopardize the use of this facility as a later repository, and that just doesn't make sense.

Mr. OTTINGER. I think that does not make any sense, it would be well to involve the NRC formally. The licensing process is too long. Maybe we ought to just require some kind of NRC approval.

Mr. Martin?

Mr. MARTIN. I think if the bill is changed to require this to be in conjunction with the site characterization program of 10 CFR part 60, where we are involved, it accomplishes the end of NRC purview. That would be our recommendation.

Mr. OTTINGER. I think that's good to have on the record, just briefly, because there is a vote on.

Mr. Meyers, would you repeat, so we have it on this record today, what you told my subcommittee with respect to your feelings on State participation and the selection of a test and evaluation facility.

Mr. MEYERS. We certainly feel that the States ought to be involved with all our activities. And when we home in on a particular State where we're doing site specific studies, at that time there should be recognizable organizations within the State that we are dealing with.

However, we don't feel that a State ought to have the authority to veto our activities at this stage or other stages unless Congress so directs.

Mr. OTTINGER. I thank the Chair.

Mrs. BOUQUARD. Thank you very much, Mr. Ottinger.

We do have a vote right now. We will recess. We will come back just as quickly as we can to resume our hearings. We won't be long.

[Recess.]

Mrs. BOUQUARD. We will resume our hearing.

While we're waiting on Mr. Goldwater, I'd like to ask for any questions that the staff has for our panel.

Mr. **Ventre**. Dr. Martin, the bill requires that the engineered barriers be designed to last as long as is necessary for the wastes to decay away such that the health hazard they pose is equal to, or less than, the health hazard of the uranium mined to generate such wastes.

There has been some discussion about this today which, I believe, incorrectly indicated that the varying conditions associated with natural ore bodies made this standard nonuniform and subject to the vagaries of estimating hazards. I hope we can pursue the issue in a moment.

Dr. Martin, can you comment on using this standard for just the engineered barriers rather than the system of engineered barriers and geology?

Mr. **Martin**. You mean, in other words, having this type of criteria pertaining to the entire system, rather than just the engineered portions; is that the idea?

Mr. **Ventre**. That's right.

Mr. **Martin**. Well, I guess I can't comment on it. Simply, we've grappled with the same problem now for almost 3 years and have decided that the best way to deal with it is to set out some minimum requirements on each of the major engineered barriers so that everyone knows what they're shooting for on the front end of this process. If we don't, several years later we'll get to the license application, with that still being an open issue. So, we've elected to rely on the EPA criteria, which they've yet to issue for the total system performance, which is very much in keeping with the natural ore body analog.

They've looked at a number of things, natural ore bodies, reactors, other threats that we normally just live with. Their standard is based essentially on the health effects that you might get from a natural ore body over a 10,000-year period.

Mr. **Ventre**. Just to interrupt there for a moment, do you think that's a suitable approach—in other words, to make the repository as safe or safer than the original uranium ore body that is an original condition of nature?

Mr. **Martin**. I think that's a sensible way to start. Then, we would have to explore—OK if you start there, is it practical to do?

I think—at least our studies over the last few years have shown that it is. It's a very sensible thing to do.

Mr. **Ventre**. Are you familiar with the techniques for determining the health hazard indices?

Mr. **Martin**. I'm not an expert on it; no. I know probably just enough to be dangerous. [Laughter.]

Mr. **Ventre**. There are a number of ways of doing that. And the ways I think that were alluded to by the previous members asking questions are of particular concern to the subcommittee. I think we had anticipated in this and in previous legislation last year that the concept for determining health hazards would be one based on diluting calculated amounts of uranium ore bodies. And in doing so, it makes the size of the ore body and the assay of the ore body irrelevant. Is that your understanding of the technique?

Mr. MARTIN. That's the technique that's commonly used in most studies I've seen, where, in fact, you don't even deal with a natural ore body. You deal in the quantity of ore that was taken to make the fuel that's being disposed of, which, of course, will come from a multitude of ore bodies of all sorts of different natural conditions.

Mr. VENTRE. So you wouldn't worry then about the assay, the source, or where you found it, or any other particulars of the uranium ore body that may exist in nature?

Mr. MARTIN. That's the way the studies are usually done. And then there's always a paragraph in there that says, "Well, don't take this too seriously because of all those caveats." But that's the way it's generally done, and it's a sensible way to proceed.

Mr. VENTRE. Would you agree that we need to change that provision of the bill dealing with design life with the engineered barriers? And if you do agree, what would you suggest as an appropriate change?

Mr. MARTIN. In my testimony I perhaps didn't say it as strongly as we should have, but I would recommend that barriers have a design life consistent with those specified by NRC for the licensed repository; choice number one.

Choice number two is also in my testimony if you wanted to be more general—is to say the time in which thermal equilibrium is achieved.

Mr. VENTRE. Do you agree with that, Mr. Meyers?

Mr. MEYERS. I'd like to differentiate between the test and evaluation facility and the repository. We don't intend that the test and evaluation facility be the permanent disposal site for the waste in there unless it reverts to a full-scale repository, at which time it would be the regulatory agency whose business it is to lay out those criteria. They do it on the basis of the latest information that comes out at the time they're doing it.

Mr. VENTRE. Would that criteron affect the design of the repository? In other words, if we didn't change anything here and just talked about engineered barriers rather than a systems approach, would that affect the design of the repository?

Mr. MEYERS. Certainly the engineered barriers would affect the design of a repository in the sense of the portion of the repository in which you placed the waste canister and the barriers. Without having specified it, then I think you have a maximum plausibility.

Mr. VENTRE. OK.

One final question on that. If we were to leave the standard in there for the engineered barriers, would it necessarily affect the use of the repository for another area, for example, upon removing the wastes from the area for the larger facility?

Mr. MEYERS. Not a requirement for engineered barriers, no; because that would be a requirement in the repository, as well.

Mr. VENTRE. So, essentially what that would do—at the worst, it would not be helpful in terms of the full-scale repository; and at best, it might be very helpful?

Mr. MEYERS. I would say that.

Mr. VENTRE. Thank you, Madam Chairman.

Mrs. BOUQUARD. Thank you.

Miss Freiwald, do you have additional questions you'd like to ask?

Please proceed.

Ms. **Freiwald**. I'd like to ask Mr. Martin a couple of questions. I understand that the NRC is proposing some siting standards. What is your standard with respect to ground water flow in the area of the repository?

Mr. **Martin**. The standards come in two tiers. The first tier are things that you have to meet in every case.

And with respect to siting, we're required that at the site you pick that the ground water travel time from the site to the environment be at least 1,000 years. That has to be met in every case. It doesn't seem to be a big problem to anyone.

Now, for the rest of the siting conditions, we've tried to recognize that almost any site has some bad features and some good features. And if we try to get too categorical, we'll wind up eliminating all the sites.

What we've done in the draft regulation is we've given a list of desirable features that you ought to have and a list of undesirable things you ought to avoid. And if you have any undesirable things, there's a mechanism for resolving it, by showing that the undesirable feature won't affect the performance of the repository and is more than compensated by desirable features. So there's a balancing mechanism on the siting, which we've concluded is the only realistic way to approach it if we're to ever have a repository.

Ms. **Freiwald**. How many sites in the U.S. have you been able to identify that would meet the standards you've set?

Mr. **Martin**. There's probably hundreds. We have not attempted to identify the sites. That's the Department of Energy's job. We do not feel—particularly with the balancing approach—that these requirements are particularly restrictive.

Ms. **Freiwald**. I understand the NRC has also issued its procedure guidelines for licensing high level waste repositories.

Mr. **Martin**. Those are final guidelines. The technical criteria are just for public comment.

Ms. **Freiwald**. Can you describe the procedural steps?

Mr. **Martin**. The procedural steps are as follows. There are basically four.

The first step is informal. It's what's called site characterization, where we believe DOE should characterize at least three sites in two geologic media, one of which is not salt; that this characterization should be carried out at depth, by sinking shafts and doing some underground exploration to explore those features that appear to be pertinent to that site.

The content of that program is left up to the department. We require that they submit a plan ahead of time, saying what the scope of this work is going to be. And we will review it for a few months, get some public input, and render an advisory opinion.

Now, the department may or may not elect to take our advice into account. We hope they will. But it's an advisory opinion, so that we don't encumber the data-gathering process with licensing or hearings, or all the other things.

And our reasoning is that it's data gathering and we shouldn't encumber that process. This corresponds to the program Mr. Meyers explained, up until about 1988. At that point, DOE will pick a site, one or more, that they want to formally submit for a license application. At that point, the formal licensing process starts and the staff would review the application, write an environmental impact statement. The application would be subject to review by a hearing board, public hearings, and the full panoply of things that's for construction authorization.

I'm presuming that that's satisfactory. You would expect about 3 years or so after they submit the application we'll reach a decision, and at that point DOE would build the facility. And at some point after that, they would submit an amendment to actually emplace waste, which would be reviewed and acted upon.

Then, in the far distant future, there comes a time when a decision has to be made to close the thing up, so years later there's a further amendment for closure of the repository.

And that, in a nutshell, is the procedure.

Ms FREIWALD. How long would that whole procedure take?

Mr. MARTIN. That depends on how—DOE, how quickly they move. I really can't say there. But we visualize that if they hustle, they can get the sites characterized sufficiently to come in with a license application by 1987. They say 1987, 1988. We agree with that.

If they do a good job, then it should be easy to conclude a license proceeding, because you're dealing with the facts. So, we figure about 3 years thereafter, 3 to 4—closer to 3—we could approve a construction authorization.

I guess at that point it's a question of whether DOE wants to build the whole repository first, before they emplace waste, or whether they want to emplace waste as they construct. They haven't thought that through.

So, beyond construction authorization, it gets a bit murky. And I think it's largely up to DOE as to how they want to proceed at that point. But I think up to actually authorizing construction, it seems to us that could be done by 1990, 1991.

Ms. FREIWALD. I presume that doesn't count time for appeals and court challenges?

Mr. MARTIN. No. But I think our view is, since we're proceeding on the basis of doing most of the technical work on the front end, rather than during the licensing process, that should be fairly minimal.

If a test and evaluation facility, as I said in my testimony, starts competing with their effort to complete the site characterization, that could string the time out.

Ms. FREIWALD. Thank you, Mr. Martin.

Mrs. BOUQUARD. Thank you very much, Miss Freiwald.

I do want to thank our panel for their participation this afternoon. I think the hearings have been very relevant. We've been certainly getting a lot of very useful and very timely information.

Thank you very much for being here.

I'd also like to ask if you would agree to questions in writing from members of the subcommittee?

Mr. MEYERS. Absolutely.

Mrs. BOUQUARD. Thank you very much.

If there are no further questions, the subcommittee is adjourned.

[Whereupon, at 11:45 a.m., the subcommittee was adjourned.]

Department of Energy
Washington, D.C. 20585

July 20, 1981

Honorable Marilyn Lloyd Bouquard
Chairman
Subcommittee on Energy and
  Research Production
Committee on Science and Technology
U.S. House of Representatives
Suite 2321 Rayburn House Office Building
Washington, D.C. 20515

Dear Ms. Bouquard:

Enclosed are the answers to the questions submitted to Sheldon Meyers subsequent to the June 18, 1981 hearing on H.R. 1909, "Nuclear Waste Research, Development and Demonstration Act of 1981" before the House Science and Technology Subcommittee on Energy Research and Production.

If you have any questions, please call Tom Pretorius of my staff on 252-4277. He will be happy to assist you.

Sincerely,

for Thomas H. Pretorius
Robert G. Rabben
Assistant General Counsel
for Legislation

Enclosures

Answers to Questions
Raised by House Subcommittee
on
Energy Research and Production
(Ref: June 18, 1981 Hearing)

Q.1 The Secretary has commented that the Department will move as quickly as possible to establish permanent storage sites for highly radioactive nuclear wastes. What specific actions will be taken by the Department to accelerate the selection of sites for high-level radioactive waste? Are you developing a new, earlier, target date for selection of the first site?

A.1 The Department has acted to accelerate the selection of sites by focusing the site exploration process to begin the construction of exploratory shafts in three locations by 1983. Construction of exploratory shafts and testing at depth at several sites are now required by NRC regulations as a prerequisite to submission of a license application. Focused examination of these first three specific promising sites will lead more rapidly to determinations of site suitability and to ultimate site selection. The target date for selection of the first repository site will be set by completion of examination of alternate sites and development of the technology required to prove compliance with standards set for the licensing process.

Q.2. What role does the T&E facility have in meeting the Administration's goals in establishing a permanent disposal site? How necessary is the T&E facility to meeting the goals?

A.2. The T&E facility represents a highly useful mechanism in the development of the engineering required to license, construct, and operate a full-scale geologic repository. Verification of design-level loading rates, for example, will ensure the adequacy of the number and design of materials-handling shafts necessary to handle the anticipated rates and loads in operating repositories. Experience is obtained in a manner which will allow assessment of the acceptability of the designs and operating procedures before committing to the full-scale design and construction.

Q.3. Assuming the Secretary had the authority to expand the T&E facility into a full-size repository if all the requirements (including site requirements) of the law regarding commercial repositories could be met, should the State role in selecting a site for this small-scale R&D facility be expanded beyond the consultation and coordination role provided in H.R. 1909?

A.3. The T&E facility will be constructed for the purpose of conducting engineering development R&D. As the exact scope of the design and tests are developed, adequate safeguards, such as complete monitoring and retrievability of all packages, can be built into the facility to ensure that it does not become a selected site by default. Therefore, formal resolution of objections to site selection by a State, as envisioned in several proposed bills, should not be required for the T&E facility but should await designation of a site for a licensed facility.

Q.4. What role do you see for the Nuclear Regulatory Commission in regard to the establishment and operation of test and evaluation facilities; and how closely do you plan to work with NRC on site characterization? In this regard, please provide us with any agreements and/or understandings you may have with NRC on interactions prior to and during site characterization.

A.4. Review and oversight by the NRC of the development and operation of the T&E facility would be carried out using the same procedures now prescribed in 10 CFR 60 for the site characterization activities. No separate agreements on this review have been drawn with NRC although DOE has stated that the procedures called for in 10 CFR 60 will be followed in the conduct of the program.

Q.5. What are the Administration's plans for expansion of the T&E facility into a full-scale repository; and how will you ensure that NRC will accept the site for consideration as a full-scale repository?

A.5. There are no current plans to expand the T&E facility into a full-scale repository, although the option to do so must be preserved. Such plans would only be developed if the results of the site characterization work to be conducted at depth clearly indicate that the site is preferred for the siting of a licensed repository. We believe that close coordination with NRC during the site characterization and T&E phases, using procedures similar to those called for in 10 CFR 60, will preserve the option of future use of the site for a licensed facility.

Q.6. Please describe the T&E facility in regard to its size and the size of a full-scale repository, the amount of high-level radioactive waste which will be emplaced in comparison to a full-scale repository, and the R&D program planned and the benefits to be derived from this facility. In particular, on this last item, please be as specific as possible. Describe the full scope of R&D planned for the facility and why it is necessary and proper to perform the work in a repository environment as opposed to a laboratory or near repository environment such as some of the test facilities DOE currently operates.

A.6. The conceptual design work for the T&E Facility is scheduled to begin in 1982. Therefore, the size, etc., must be discussed in general terms until that planning is completed. More detail can be discussed in future budgets. The total acres and the spacing of the waste packages and the number of waste packages depend on the tests to be conducted and the heat generating rate of the containers. We visualize that several hundred containers will be required to adequately test the handling capacity of shafts and emplacement equipment under actual radioactive conditions. The tests to evaluate the operation, to evaluate resulting radiation doses, to backfill and retrieve waste, to instrument and to monitor the repository area, etc., are expected to occupy less than one percent of the space for a repository having 2000 acres and containing high-level waste and transuranic waste from reprocessing 160,000 metric tonnes of spent fuel. Emplacement may be in the range of 20-40 HLW canisters per acre, but it must be confirmed by further tests and analysis of an acceptable number.

The purpose of the T&E Facility is to permit testing of the operating aspects of a repository using actual radioactive waste. It permits testing of the engineering features of equipment and instrumentation with radioactive waste as a precursor to the final licensing of a repository. It confirms the designs in the same way that initial radioactive testing is conducted to prepare for operation of other large radioactive facilities and hot cells. The kinds of evaluations being planned for the facility include testing of the capacity or rate handling capability of equipment and shafts for emplacement of waste, the radiation exposures which result and the backfill and retrieval operations for removal of the waste. Also, using instrumentation to monitor temperature and stresses will confirm the design and possible use of a pilot room as a means of indicating the trends in the repository as a method of working with NRC on the early monitoring phases of an actual repository. The multibarrier waste packages will be emplaced and retrieved. The effects of the handling, emplacement, and retrieval on the waste package will provide an indication as to the acceptability of the proposed multibarrier design when subjected to handling and emplacement operations. Testing work will have been previously done in the laboratory and in engineering or surface facilities and the T&E Facility provides the confirmation needed at that time to move forward with the licensing of a repository. The experience of a nonradioactive and radioactive basis will have progressed previously in currently operated DOE test facilities and many of them will be shut down by the time the T&E Facility is operating.

Q.7. What is the DOE or NRC cost estimate for the site characterization process required by NRC regulations for full-scale high-level waste repositories.

A.7. Exploration costs to screen for identification of potential sites involves an investment of about $50 million (81) for each. Site characterization with exploratory shafts as required by NRC regulation will involve expenditure of another $60 to $80 million (1981) for each site, most of which is for shaft and at-depth tests.

Q.8. Last Congress, almost all legislation on nuclear waste repositories stipulated that full environmental impact statements would not be required for site characterization work. Environmental assessments were required for site characterization work. The NRC has also taken the same position, which is considered to be in full compliance with the law since site characterization work will provide essential data for a competent environmental analysis. Please explain your statement during the hearing that an "environmental impact statement analysis" would have to be made to select the sites for characterization. Also please address how this position differs from the NRC's position.

A.8. The cited statement made by Mr. Sheldon Meyers during the June 18, 1981 Hearing (commencing on line 1423, page 58 of transcript of Hearing) was made in the broad context that no repository site would be recommended without full compliance with the NEPA process. On reflection, it would have been more accurate for Mr. Meyers to have said (on line 1425, page 58) "environmental assessment analysis" rather than "environmental impact statement analysis."

By way of background, the term "site characterization" was being used at the time of the last Congress to include such work as borehole drilling, seismic reflection surveys, and surface examinations. It was generally agreed that such work would have little environmental effect and that an EIS would likely not be required. On February 25, 1981, the NRC issued their procedural rule, 10 CFR 60, Subparts A-D, in final form. This rule requires that excavation of shafts and in situ tests at repository depth be conducted as part of the characterization of a repository site, and further requires that shafts also be excavated at alternate sites. Selection of sites and excavation of such shafts, especially if done off of DOE-owned sites, may generate considerable public interest. Shaft excavation will also leave a spoils pile which may have environmental impact. For these reasons, the Department considers that an EIS may be required, unless a preliminary assessment indicates otherwise. For Department sites at Hanford and near Las Vegas, it will be necessary to see if such impacts may already be addressed in existing EIS's for site operations. The Department's position on the level of environmental documentation is in a formulative stage. We do not expect NRC's position to vary greatly from ours.

Q.10. In you testimony, you stated that the definition of "high-level radioactive waste" "does not take into account waste generated under abnormal conditions" and that it "would not allow the Nuclear Regulatory Commission sufficient latitude to define waste according to hazard". Please clarify why the limited scope T&E facility has any impact on NRC authority and why wastes from abnormal conditions should be a part of this demonstration. Should this limited demonstration be focused on abnormal waste, or that form to be most commonly found?

A.10. Our concern about the definition of HLW arises from the fact that HLW is now defined in law only by NRC regulations. Any Congressional Act which defined HLW in too narrow a way so as to restrict the latitude of the NRC to require appropriate disposal of wastes according to their hazard could be counter-productive.

We did not intend to propose that definitions of the scope of the T&E facility should affect the authority of the NRC. We propose that DOE retain the latitude to emplace whatever materials in the T&E facility are necessary to resolve engineering development issues. We currently have no proposal to emplace abnormal wastes in the T&E facility but suggest that we retain the option to do so if such emplacement were to prove to be beneficial to the development program.

Q.9. Would you recommend that spent fuel be included as a waste form to be used in the T&E facility? If yes, please explain the benefits of doing so. Would your answer to this question be the same if President Reagan reversed the Carter Administration's indefinite deferral on reprocessing? If spent fuel is included as a waste form, will the spent fuel used in the facility be treated so that it becomes technically or economically unreprocessable?

A.9. We do not currently anticipate the use of spent fuel as a waste form in the T&E facility. A number of projects planned or authorized provide alternative sources to stablilized HLW and studies to determine the most preferred source of waste packages of HLW for the T&E facility will be conducted.

Should the use of spent fuel become appropriate in the facility, no treatment to render the spent fuel unreprocessable would be anticipated. All material placed in the T&E facility will be fully monitored and waste will be retrievable so if spent fuel were to be used it could readily be recovered for subsequent reprocessing if appropriate. An example of the use of spent fuel might be as a high radiation or heat source to test the equipment for the highest levels of radiation anticipated from future solidified high level waste.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 1, 1981

The Honorable Marilyn L. Bouquard,
Chairman, Subcommittee on
Energy Research and Production
Committee on Science and Technology
U.S. House of Representatives
Washington, D.C. 20510

Dear Madame Chairman:

Enclosed are responses to the questions attached to your letter of July 9, 1981, regarding U.S. Nuclear Regulatory Commission's (NRC) testimony on H.R. 1909. We understand that this bill was reported by your Subcommittee on July 16, 1981, and in order to provide our views in most useful form, we have addressed ourselves to the bill as reported.

As we testified before the Subcommittee on the original version of this bill, we believe that any such testing and evaluation should be integrated into the ongoing program now being executed by the Department of Energy (DOE) to characterize sites for a licensed repository. The bill as rewritten by the Subcommittee, however, may redirect the national program away from site characterization for a licensed repository and narrow the purpose of site characterization to the selection of a site for a test and evaluation facility outside the framework established pursuant to the Energy Reorganization Act of 1974. We cannot support such an approach.

Again, we urge that consideration be given to integrating the research and development proposed in this bill into the ongoing national program aimed toward site characterization for licensed repositories. We appreciate your continuing interest in solving the nuclear waste management problem, however, and look forward to continuing collaboration on this important national issue.

J B Martin for
John G. Davis, Director
Office of Nuclear Material
Safety and Safeguards

Enclosures:
Responses to Questions

RESPONSES TO QUESTIONS FROM THE HONORABLE MARILYN L. BOUQUARD, CHAIRMAN, SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION, COMMITTEE ON SCIENCE AND TECHNOLOGY, U.S. HOUSE OF REPRESENTATIVES

Question 1: Would you characterize the R&D program to be authorized by H.R. 1909 as being primarily consistent or inconsistent with the programmatic approach leading to a full-scaled repository envisioned by NRC?

Answer:

From our understanding of H.R. 1909, we believe aspects of the bill are inconsistent with the NRC programmatic approach. To provide a frame of reference, we will first describe our program before identifying where the bill diverges from it.

The Commission's 10 CFR Part 60 procedures for licensing geologic repositories require the characterization of at least three sites in two different host media to evaluate their geologic suitability as potential full-scale repository sites. DOE is required to submit site characterization plans to NRC for evaluation and comment to assure that DOE's activities meet NRC's information needs for expeditious licensing review and do not compromise the licensability of the site. After completing the characterizations and selecting a site, DOE could apply to NRC for an authorization to construct a full-scale repository capable of receiving either spent fuel or reprocessing wastes.

Regardless of NRC authority over test and evaluation facilities, the Commission recommends that DOE follow Part 60 for any test and evaluation facility which might possibly become a geologic waste repository. Otherwise, it is possible that an application to expand a test and evaluation facility into a repository would have to be denied or delayed because the licensability of the site was compromised or adequate licensing information was not gathered.

Part 60 permits the use of radioactive materials in site characterization to the extent needed to evaluate the suitability of the site. Waste handling operations at a possible repository site using larger quantities of radioactive materials may be useful for determining the suitability of a site to host rapid waste emplacement rates as well as developing and testing the safety and cost-effectiveness of materials handling techniques and emplacement systems. These operations, however, should take place under the pre-licensing advisory provisions of 10 CFR 60 since the site has the potential of becoming a full-scale repository.

The R&D approach proposed in H.R. 1909 is or may be inconsistent with the NRC approach outlined above in several respects:

1. The bill may redirect the national geologic repository site characterization program from one that would lead to selection and development of permanent licensed repositories to one that is primarily directed toward selecting a site for a T&E facility which might be unlicensed. The Commission has no objection to the construction of an R&D facility at a potential repository site if such a facility is fully integrated into the framework of our regulations. It should not become a substitute for nor interfere with the development of a full-scale licensed repository.

2. The bill provides for the construction of a T&E facility that could be expanded into a full-scale repository without NRC review or licensing pursuant to existing law. Section 4(b)(4) would require new legislation to permit expansion of R&D activities to full-scale disposal. This provision could alter the normal process for expansion under our regulations in two major ways:

    a. determining "the applicable requirements for high-level waste repositories" would no longer be a matter for NRC's judgment in the exercise of its licensing and regulatory authorities;

    b. the role of the Commission in determining compliance with new requirements is unclear.

    The uncertainties arising from Section 4(b)(4) could be avoided by amending it to require that the expansion of the facility be in accordance with the licensing provisions of the Energy Reorganization Act.

    In any legislation authorizing a test and evaluation facility, the Commission suggests that Congress' intent on the licensing question be made explicit.

Question 2: Would you support a modification to Sec. 4(b)(3) which would permit the expansion of the T&E facility into a full-size repository if all the requirements (including siting requirements) of the law regarding commercial repositories could be met (assuming such generic legislation is later enacted)?

Answer:

In the interest of economy, we believe that a T&E facility should not be barred by law from becoming a full-size licensed repository. However, we believe that in order for this to occur in an expeditious manner, the T&E facility should be developed under the pre-licensing advisory provisions of 10 CFR 60.

Question 3: Would you recommend that spent fuel be included as a waste form to be used in the T&E facility? If yes, please explain the benefits of doing so. Would your answer to this question be the same if President Reagan reversed the Carter Administration's indefinite deferral of reprocessing?

Answer:

We believe that spent fuel as a waste form for testing and evaluation should not be ruled out, especially not by law. In a conservative approach to the technical uncertainties involved, NRC's 10 CFR Part 60 rules have been developed to accommodate either spent fuel, high-level reprocessing wastes, or both. In our view, the prudent approach would be to design a repository to accept both spent fuel and high-level wastes. This would keep open an alternative management strategy if the preferred option is foreclosed. Conversely, failure or refusal to conduct R&D on both spent fuel and HLW would limit the timely availability of alternatives. This could eventually pose an unwelcome choice: either to redirect the national effort later at more cost and disruption to dispose of spent fuel, or to support a reprocessing program simply because our repositories have ~~been~~ designed for its wastes alone.

The Commission's response to this question would not be different if President Reagan reversed the indefinite deferral of reprocessing. If reprocessing is left to private industry, a change in government policy would by no means assure commercially viable operations and the timely availability of reprocessing. A reversal of Presidential policy should not, therefore, permit a prudent disposal program to ignore spent fuel.

Question 4: In regard to repository technology, what R&D do you believe must be done and satisfactory answers obtained in order to license a repository?

Question 4.a: How are you acquiring the necessary R&D, and what agencies and organizations are providing this service?

Answer:

In the area of high-level waste management, the Commission's technical assistance and confirmatory research program will address the following:

-assessment of uncertainties associated with : (1) site characterization: (2) the introduction of radiation and heat into a geologic system; and particularly; (3) geochemical retardation and the reliability of engineered barriers to perform under repository conditions;

-evaluation of the performance of waste forms and containers, of engineered underground facilities, and of the surrounding geologic media relative to the long-term isolation of HLW;

-assessment of the safety of system performance during routine operation, waste retrieval, and following repository closure, and;

-assessment of the consequences of potential accidents.

This information is primarily generic in nature and is being developed under contract to DOE laboratories, other Federal Agencies and private contractors. In addition, there is need for site and design specific information that must be provided by DOE in its licensing documents. These data would be obtained by DOE during site characterization with NRC playing an advisory role, as detailed in the procedures of 10 CFR Part 60, Subpart A.

Question 4.b: Could the T&E facility provide the data and experience that would speed the ultimate licensing of a repository?

Answer:

We are uncertain whether the T&E facility envisioned in this bill would speed licensing. Some of the data and experience to be gathered at the proposed T&E facility would be useful to NRC in preparing to license a full-scale repository, but the bill's program to acquire the data and experience could delay the licensing of a repository. This is because the bill may redirect the national program toward the construction and operation of a T&E facility, which could detract from the effort of the current program leading to a licensed repository.

Question 4.c: Could it conceivably be beneficial for the R&D to be done in a repository environment as envisioned by H.R. 1909?

Answer:

In general, any research and development that relates to the specific geologic environment and its interaction with possible waste forms should be conducted in a potential repository environment. We believe some R&D activities, such as assessing the effects of heat and pressure on the integrity of waste packages, could more easily and cost-effectively be conducted in the laboratory.

Question 5: Assuming DOE proceeds with its T&E facility, does NRC plan to work with DOE on an informal basis to develop the information necessary for licensing repositories and to review and provide comments on the characterization of sites?

As part of this question please provide your understanding of DOE's program leading to selection of the T&E facility and any agreements and/or understandings you have with DOE on NRC's role in the T&E facility program.

Answer:

If T&E facilities are determined to be desirable, NRC believes that they should be developed in accordance with the pre-application review procedures set forth in 10 CFR Part 60. NRC would therefore work with DOE in accordance with procedures set forth in this regulation. The selection of a T&E facility site would take place during the site characterization phase, which precedes the onset of formal NRC licensing proceedings. This phase provides for NRC review and comment on planned DOE site characterization activities to assure that they do not compromise the licensability of the site and that they meet NRC's information needs for an expeditious licens~~ing~~ review.

NRC has not entered into any agreements or understandings with DOE regarding NRC's role in the Department's proposed test and evaluation facility program.

Question 6: It is not clear why NRC in its 10 CFR Part 60 licensing rule has selected the heat pulse as a basis for the 1000-year engineered waste package. Please explain why the heat pulse was chosen as the criteria and what its selection provides as opposed to other criteria.

Answer:

In attempting to assess the suitability of different geologic systems for waste isolation, many of the principal uncertainties have a common source: the effects of radioactive decay heat. There are, for example, a number of chemical reactions that can significantly affect repository performance: hydration, dehydration, formation of strong acids, sorption, solution, buffering reactions, gas-producing reactions, reactions that produce volume changes, and reactions forming concentrated brines in salt. Each of these is affected by temperature. Heat breaks down hydrated minerals to release water, for instance, and hot moving fluids may dissolve more of some minerals to produce greater changes in others nearby. Similarly, temperature affects important hydrologic processes at a site, such as the creation and circulation of convection cells, the induction of pressure gradients, changes in viscosity, changes in rock stress fields, and changes in bulk permeability of the rock. The strength and duration of the heat pulse to which these processes are exposed is the single most useful criterion by which their effects can be assessed. Other performance criteria are not as comprehensive.

Since the heat pulse is such an important variable affecting so many others, we have proposed that an engineered waste package should be able to contain all radionuclides for at least the period necessary for temperatures to peak and return to a level approaching ambient temperatures in the geology. This would substantially reduce the number and significance of uncertainties inherent in assessing the long-term performance of the system. A number of investigations project that temperatures in a repository will peak and begin to fall within the first few hundred years after the waste has been emplaced. Total radioactivity will also decrease by several orders of magnitude over the same period. As temperature decreases, many of the uncertainties in the behavior of the host rock also abate, and the decay of the wastes during this period reduces the total radioactivity that could escape to the biosphere as well. Using a technically conservative approach, as recommended by the Interagency Review Group on Nuclear Waste Management, we have proposed that the waste package should be able to contain the radionuclides for a minimum of a thousand years.

Question 7: What is the NRC cost estimate for the site characterization process required by its regulations? If no such estimate is available, please explain how the NRC requirements for characterization were or are justified.

Answer:

NRC construction cost estimates for at-depth site characterization are 25 to 30 million dollars for soft rock such as salt. Cost estimates for site characterization in hard rock may range up to 30 percent more. This compares with a DOE contractor's cost estimate of $28 million for an in situ test facility at the Waste Isolation Pilot Plant site in bedded salt, and another DOE estimate of $20 to $30 million for a test facility in tuff at the Nevada Test Site. These estimates are for construction only and do not include the cost of the actual testing, which we estimate at two to three million a year, depending on the tests DOE decides to conduct.

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July 9, 1981

John G. Davis, Director
Office of Nuclear Material Safety
 and Safeguards
Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Davis:

The Subcommittee on Energy Research and Production was pleased to receive your testimony on H.R. 1909, "Nuclear Waste Research, Development and Demonstration Act of 1981" on June 18, 1981. As you will recall, you agreed to answer any further questions the Subcommittee submitted to you in writing. Accordingly, we would appreciate if you ~~would~~ provide answers to the questions attached to this letter.

We have enclosed transcripts of the hearing and request that you review and correct your testimony and comments. Please return the corrected transcript along with the answers to the attached questions within seven working days after the transcript and questions are received. We are attempting to complete the record on H.R. 1909 by the middle of July and need your input in order to meet this schedule.

I would like to thank you again for testifying before the Subcommittee. Your remarks are important and will be fully considered as we proceed toward markup of H.R. 1909.

Sincerely,

Marilyn Bouquard

MARILYN L. BOUQUARD, Chairman
Subcommittee on Energy Research
 and Production

MLB:Ssw
Enclosures

QUESTIONS FOR JOHN G. DAVIS, DIRECTOR
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
NUCLEAR REGULATORY COMMISSION

1. Would you characterize the R&D program to be authorized by H.R. 1909 as being primarily consistent or inconsistent with the programmatic approach leading to a full-scaled repository envisioned by NRC.

2. Would you support a modification to Sec. 4 (b)(3) which would permit the expansion of the T&E facility into a full-size repository if all the requirements (including siting requirements) of the law regarding commercial repositories could be met (assuming such generic legislation is later enacted)?

3. Would you recommend that spent fuel be included as a waste form to be used in the T&E facility? If yes, please explain the benefits of doing so. Would your answer to this question be the same if President Reagan reversed the Carter Administration's indefinite deferral of reprocessing?

4. In regard to repository technology, what R&D do you believe must be done and satisfactory answers obtained in order to license a repository? How are you acquiring the necessary R&D, and what agencies and organizations are providing this service? Could the T&E facility provide the data and experience that would speed the ultimate licensing of a repository? Could it conceivably be beneficial for the R&D to be done in ~~a~~ repository environment as envisioned by H.R. 1909?

5. Assuming DOE proceeds with its T&E facility, does NRC plan to work with DOE on an informal basis to develop the information necessary for licensing repositories and to review and provide comments on the characterization of sites?

   As part of this question please provide your understanding of DOE's program leading to selection of the T&E facility and any agreements and/or understandings you have with DOE on NRC's role in the T&E facility program.

6. It is not clear why NRC in its 10CFR Part 60 licensing rule has selected the heat pulse as a basis for the 1000 years engineered waste package. Please explain why the heat pulse was chosen as the criteria and what its selection provides as opposed to other criteria.

7. What is the NRC cost estimate for the site characterization process required by its regulations? If no such estimate is available please explain how the NRC requirements for characterization were or are justified.

H.R. 5016—NUCLEAR WASTE MANAGEMENT COMPREHENSIVE LEGISLATION—BOUQUARD/LUJAN PROPOSAL

MONDAY, OCTOBER 5, 1981

House of Representatives,
Committee on Science and Technology,
Subcommittee on Energy Research and Production,
Washington, D.C.

The subcommittee met at 2:30 p.m., in room 2318, Rayburn House Office Building, Hon. Marilyn Lloyd Bouquard (chairman of the subcommittee) presiding.

Present: Representatives Bouquard, Young, Lundine, Volkmer, Wolpe, Lujan, Lowery, and Goldwater.

Also present: Representative Scheuer.

Staff present: John V. Dugan, Louis Ventre, and Joyce Gross Freiwald.

Mrs. **Bouquard**. The subcommittee will come to order.

Good afternoon, ladies and gentlemen. Today the Subcommittee on Energy Research and Production will receive testimony on civilian nuclear waste management policy issues. In particular, we hope to examine a Bouquard/Lujan proposal for comprehensive nuclear waste management legislation and Mr. Lundine's bill, H.R 1993, the Radioactive Waste Research, Development, and Policy Act.

Both legislative proposals establish a national program for the disposal of high level radioactive waste. The program will be a Government effort aimed at establishing a deep geologic repository in the continental United States. It will be funded by the current users of nuclear energy through fees collected by the Secretary of Energy.

Both legislative proposals would require a strong cooperative effort between the Federal Government and the States and between the various branches of the Federal Government.

We are holding this hearing and a hearing scheduled for Wednesday, October 7, 1981, for a number of important reasons. Mr. Lundine was particularly interested in having the subcommittee hold hearings on his bill, H.R. 1993. In consultation with the chairman of the full committee, Mr. Fuqua, I agreed to hold hearings on the comprehensive waste management issue, including Mr. Lundine's bill, if we could also receive commitments from the other major committees of our jurisdiction that they were willing to move a comprehensive nuclear waste package. Those commitments have been made principally by Mr. Ottinger for Commerce and independently by Mr. Udall for Interior.

I had originally anticipated that the subcommittee would hold these hearings subsequent to final committee markup action on H.R. 1909, the Research and Development Act for Waste Disposal. However, 13 members of the full committee prevailed upon the chairman to withhold any action at the full committee level on the R. & D. bill until the subcommittee had an opportunity to consider comprehensive nuclear waste legislation.

In view of the commitments that we received to move comprehensive legislation, I agreed with the chairman that the subcommittee should first act upon the comprehensive legislation before final committee action was taken on H.R. 1909.

I am looking forward today to hearing Mr. Ottinger's timetable in the Energy and Commerce Committee for action on this legislation, so that the subcommittee can get a feeling for the overall schedule.

I understand that Mr. Udall will be marking at subcomittee at Interior no later than Tuesday, October 13. I'd like to point out to the members of the subcommittee that the Bouquard/Lujan proposal is chiefly a vehicle on which to focus our discussion. Mr. Lujan and I will be most receptive to receiving the subcommittee's views and comments, both before and after subcommittee markup. We hope to be able to accommodate as many members' views as possible, bringing to the full committee a reasonable compromise on nuclear waste issues.

I might add that the time for action on the comprehensive nuclear waste legislation is ripe with all major parties in the House and the Senate apparently in agreement on many major issues concerning this subject.

We have held many hearings on the nuclear waste issue, including two sessions earlier this year, and it is my hope this hearing and the one on Wednesday will bring out the remaining issues to be considered and will bring us closer to seeing that the committee's previous actions come to fruition.

Our subcommittee will then have a solid basis to move to markup, which we now have tentatively scheduled for October 15, 1981.

I would like to add with respect to the Bouquard/Lujan proposal that Mr. Lujan and I consider it a significant compromise between the positions of the various committees taken in the last Congress. The proposal was formulated with significant input from Chairman Fuqua's staff, the Energy and Commerce Committee staff, majority and minority, as well as Mr. Lujan's concerns from his perspective as ranking Republican on the Interior and Insular Affairs Committee.

The subcommittee staff is still negotiating with the Commerce staff and Mr. Udall's staff to attempt to reach agreement on legislative language. Our proposal borrows from much of the existing legislation past and present on this subject, including the Interior Committee's bill, H.R. 3809, the Commerce Committee's action on last year's R. & D. bill, last year's and this year's Senate bills, Mr. Lundine's bill and, of course, this year's R. & D. bill, 1909.

There were several principles adopted formulating the Bouquard/Lujan proposal. The proposal specifically excludes military waste, thus preserving the status quo on this particular issue. The proposal integrates the Committee on Science and Technology's test and evaluation facility into the overall repository program, so that it serves as a focus and a licensing basis for the first licensed repository. The proposal gives the States a strong and expansive consultation and cooperation role in the entire repository program, except that in the R. &. D facility, the role envisioned for the State would not permit the State to raise objections before the President or the Congress in a formal manner as with the full-scale repository.

The proposal gives the Nuclear Regulatory Commission a very significant consultative role in the early repository program and in the T. & E. facility. Mr. Lujan and I both feel this is a significant compromise over what the committee had proposed in the past two R. & D. bills on this subject. Our proposal provides for signficant monetary payments to the States which have candidate sites. It provides for streamlining of environmental, regulatory, and judicial reviews, while providing assurance that all substantial issues raised in terms of health, safety, and the environment will be fully and carefully evaluated through the two Federal agencies, the Department of Energy and the Nuclear Regulatory Commission.

Our proposal includes a spent fuel R. & D. provision which is essentially identical to the R. & D. provision approved by the committee during the last Congress in H.R. 7418. The proposal provides for funding the entire program, including the research and development portion through fees collected from the generators of waste as negotiated by the Secretary.

Finally, the proposal establishes a repository operation date of 1996, which is a moderate improvement over the Secretary's program, but is by no means accelerated to the point it could be, if the project were totally exempt from NEPA requirements and NRC licensing. It's my hope that this compromise bill will garner the support of those previously opposed to the actions of the subcommittee and the committee in formulating a nuclear waste policy for our Nation.

We have attempted to be very reasonable in our proposal, and I want to emphasize that our proposal is an initial vehicle, and we're willing to accept suggestions for its improvement which have broad consensus of the committee. As we move to full committee markup, we hope to incorporate features on which agreement is reached by other committees of jurisdiction.

Let us act on this legislation, not just because the industry wants it or certain environmental groups want it, or even because the administration wants it, but because our country needs it.

We're very fortunate today in having witnesses with a substantial amount of experience in the nuclear waste management business. Our first witness will be Dr. Shelby Brewer, Assistant Secretary for Nuclear Energy at the U.S. Department of Energy. Dr. Brewer has been before this subcommittee and the committee a number of times in the past, and we want to welcome him here today.

Our next witness will be Dr. Tom Cotton from the Office of Technology Assessment, a research arm of the Congress. Dr. Cotton has been very helpful in staff discussions on formulating a comprehensive waste bill, and we welcome his expertise in this field in evaluating the proposals now before us.

Finally, we'll hear from Dr. Linn Draper, Jr., who is the vice president of Gulf States Utilities Co., appearing on behalf of the American Nuclear Energy Council, Edison Electric Institute, and the Utility Nuclear Waste Management Group.

At this point, I would like to recognize our ranking Republican member, Mr Lujan, for any opening remarks he might wish to make. Then I will recognize Mr. Lundine, if he wishes to make an opening statement.

Mr. LUJAN. Thank you, Madam Chairman. I'm happy to be able to join with you in presenting this legislation. I believe it could represent a consensus approach that would have a broad base of support, not only within the Congress, but also from the various agencies, from the State governments, from industry, and from citizens.

This committee has long recognized the importance of a test and evaluation facility in achieving the goals of the waste management program. We've been concerned with how to integrate those objectives of research, development, and demonstration into the overall program, especially in view of scheduling, budgetary, and other resource constraints.

Mr. Winn has expressed his concern about the overall schedule before we have a full-scale repository. Since the President has asked us to cut Federal spending by 12 percent, the fiscal limits may tighten. So in view of these considerations and the limited number of available sites for a repository, I believe that this proposal offers an excellent approach for integrating the test and evaluation facility into the overall program. It would help minimize the time delay. It would make efficient use of funding. It would make efficient use of suitable sites.

This proposal does represent an innovative step in the right direction, because it allows for a consultation and cooperation role for the State in which a test and evaluation facility is to be sited. Because I sit both on this committee and the Interior Committee, I've been especially involved in the issue of State participation in the State selection process and the issue of licensing of a repository by the Nuclear Regulatory Commission. Many members have expressed the concern that a strong role for the State would delay the licensing process and result in a continual postponement of the date when we would actually have a full-scale depository operating.

I am pleased that Mrs. Bouquard and I can agree on a proposal which promises to give the States a strong role and gives the Nation a repository in operation, hopefully, by 1995. I personally believe that we will need a strong mix of energy resources in the future, including solar, geothermal, fossil, and fission, but regardless of whether or not you support nuclear energy, we must all recognize that the existing high-level radioactive waste must be disposed of safely. To delay the operation does nothing to eliminate what the public recognizes as a potential threat to health and environmental quality.

For this proposal to represent a consensus, we need to have input from different points of view, and I'm looking forward to hearing from our witnesses this afternoon.

Thank you, Madam Chairman.

Mrs. BOUQUARD. Thank you, Mr. Lujan.

Mr. Lundine?

Mr. LUNDINE. Thank you very much, Madam Chairwoman. I want to compliment you for not only calling these hearings, but for focusing the attention of the subcommittee on the broad issues affecting nuclear waste management and the development of a comprehensive waste management program. I think we're making considerable progress not only in this committee but in dialog with the others who have some jurisdiction, and I'm hopeful that this year we really can adopt comprehensive nuclear waste management policies that will go a long way toward addressing probably one of the greatest environmental problems facing our society.

I have a complete statement which I would like to ask be made a part of the record.

Mrs. BOUQUARD. Without objection, it will be made a part of the record.

[The opening statement of Mr. Lundine follows:]

Opening Remarks
Congressman Stan Lundine

Energy, Research and Production Subcommittee
October 5, 1981

Today, we are taking an important step forward in efforts to reconcile past differences among three House committees to insure that comprehensive nuclear waste management legislation is among the accomplishments of the 97th Congress. Up until now, this committee has concerned itself only with those aspects of the nuclear waste program with which it has direct legislative jurisdication, namely, reserach and development, without much consideration for the manner in which the reserach and development program being authorized by this committee is to fit into the overall efforts by the Interior and Commerce Committees to implement a permanent, licensed nuclear waste disposal system. Today, we embark on an effort to integrate the research and development program in the area of nuclear waste management into our efforts to develop licensed full scale geologic repositories for the disposal of our high level nuclear wastes.

H.R. 1993, legislation I introduced earlier this year would establish a comprehensive nuclear waste management program. I recognize some of the aspects of the approach outlined in H.R. 1993 in the provisions of the draft legislation being presented today for discussion by Chairwoman Bouquard and Congressman Lujan. However, there'are important differences between our two approaches, which I hope can be explored fully during these hearings and in the upcoming weeks by the Science and Technology Committee.

The key issue which must be probed today and in future weeks by the members of this Committee is the precise role, if any, a test and evaluation facility is to have in our efforts to implement a permanent disposal system. I believe there is a role. However, such a facility must be relevant to and integrated with the permanent disposal program. It is not clear that it is necessary to implace radioactive materials into the ground prior to the onset of the actual Nuclear Regulatory Commission licensing process involving the potential site of a permanent disposal facility. Moreover, it is not clear whether it is necessary to co-locate a test and evaluation facility, in any event, with the site of a potential repository, or even if this is wise.

In addition to understanding the role for our reserach program in our overall national effort, any comprehensive nuclear waste legislation should contain several provisions:

1. A requirement for the establishment of an overall national plan for implementing a system for the disposal of radioactive wastes. This plan, once adopted, can provide continuity over time as a reference plan for Congress and for the utilities.
2. Timetables for the development of permanent disposal facilities and a detailed understanidng of how various research and development measures can contribute to this overall goal.
3. Meaningful institutional mechanisms for resolving federal-state conflicts over the siting of research and development facilities and permanent repositories.
4. A repository trust fund to be financed by utility payments and used to implement the national plan.
5. Impact payments to states in which waste disposal facilities are sited.
6. Federal policy on the interim management and disposition of spent nuclear fuel. Such a policy statement should address the reprocessing of spent nuclear fuel, as well as provide for licensed commercial demonstration for on-site dry storage of spent fuel at utilities.
7. Maintenance of the status quo under the Atomic Energy Act on disposal of military wastes. Licensed repositories must be developed to accomodate both commercial and defense solidified high level nuclear wastes.

I look forward to the testimony and to addressing these issues with my colleagues on this and other relevant committees of the House and Senate.

Mr. LUNDINE. Let me just mention a few things that I believe are very important to be in any waste management bill.

First, I think there should be an emphasis on permanent disposal, and the test and evaluation facility or R. & D. program should be oriented to that permanent disposal objective.

Second, I think the State participation process can be applied without excessive delay. We must find a mechanism for participation without undue delay.

Third, I think we should have time-oriented goals for repository development.

Fourth, I think we must face up to whether we are going to allow for reprocessing or not. It's the question that everybody's dancing around. But in fact, you can come to very different conclusions about what you ought to do about waste, depending on whether you're going to have reprocessing. I realize that administrations change, and even Congresses change from time to time, but as nearly as we can, it seems to me that we ought to adopt a policy statement concurred in by the majority in the Congress and in the administration with respect to reprocessing.

Fifth, I guess I think we should have a policy statement on spent fuel. We ought to consider some dry storage at the site of the utilities and Federal demonstration and retrievable storage.

Finally, I think we've got to address how we're going to finance it. In my view, the utilities ought to finance the program to insure that those people who are benefiting from nuclear power, and I honestly do evaluate it as benefiting, and not the general taxpayers, who are effectively paying for the program. But in any event, I believe that as Mr. Lujan has suggested, operating within very tight budgetary constraints, we do have to look at the financing.

Thank you very much for focusing this hearing not only on the bill which you and others have introduced, but on that legislation, H.R. 1993, I introduced earlier this year. And as you suggested, Madam Chairman, I'm not locked into any particular proposal. I think these are great hearings and have the opportunity to focus on how we can improve anyone's approach on any one of a number of different issues that face us in developing a comprehensive waste management program.

Thank you.

Mrs. BOUQUARD. Thank you very much, Mr. Lundine. I would like to express my appreciation to Congressman Scheuer for being present today. He's chairman of the Environmental and Natural Resources and Agriculture Subcommittee and certainly has an interest in nuclear waste. We thank you for being here with us today.

Mr. SCHEUER. I thank the chairman. I want to congratulate the gracious lady, the chairman of this subcommittee, for her initiative and for her leadership and for the high intelligence with which she has moved this matter along. I suppose like most of us I am a strong supporter of nuclear energy.

It's the cleanest and safest and probably the cheapest way, significantly, to increase our energy output. The one stumbling block, as everybody knows, is this agonizing problem of nuclear waste. And it's very difficult for us to make a pronuclear stance credible, when people can throw in our face, "Well, how are you going to get rid of this stuff? And what moral right do you have to go ahead with a pronuclear policy, not knowing how you're going to dispose of the poisonous nuclear wastes?" Well, I don't have any ready answer to that.

I think you're due a great deal of credit for that, Madam Chairman, for having put in the time that you have and the effort that you have and the high intelligence that you have, in bringing us to the point where we are now.

I went on a trip with Congressman Udall last Easter to England, France, and Germany investigating their projects and their future plans for getting rid of nuclear waste, and we had a most interesting trip and learned a very great deal, and I think we're going to move forward very rapidly under the legislative structure that you have created. I'm very happy to cosponsor your legislation, and I again want to congratulate you for a very high quality of leadership.

Mrs. **Bouquard**. What can I say? The Chair accepts these precious accolades.

Mr. Goldwater is the author of our T. & E. facility bill, H.R. 1909. I'd like to recognize you, Mr. Goldwater, for any remarks you'd like to make.

Mr. **Goldwater**. Thank you, Madam Chairman.

Every time I attend one of these hearings, I hear statements made that we need to study these problems more, and I have to conclude or raise the question, perhaps we've studied it to death.

I brought out of our library a collection of literature relevant to high level and intermediate level radioactive waste. There are two volumes here which list some 11,922 publications of research that has been done on this particular subject throughout the world.

In times of tighter finances, I believe it is perhaps wrong for us to waste the public's money continually doing paper studies. It kind of reminds me a bit of the classic "professional student" who is continually going to school, financed by his parents.

I think in this situation the radioactive waste continues to pile up like bad debts. When I was involved with a proposal, H.R. 1909, I was interested in providing a mechanism to actually demonstrate that we did have the technical capability to dispose of high level radioactive waste. The idea was that the decisionmaking process for the full-scale repository would be helped by a demonstration of our competence to deal with these waste matters. My proposal also provided some focus to research objectives for the test and evaluation facility.

I'm pleased to see that the concepts of that bill have been incorporated into the proposals by the chairman and the ranking minority member, Mr. Lujan.

The enhanced role of the Nuclear Regulatory Commission in the testing and evaluation phase will clearly increase the competence of that facility and the licensing of a full-scale repository. This raises my hopes that we will, indeed, have a full-scale repository in operation by the end of this century.

And with that note of optimism, I look forward to these hearings.

Mrs. **Bouquard**. Thank you very much, Mr. Goldwater.

Mr. SCHEUER. Madam Chairman, may I ask unanimous consent that the record be kept open for members to enlarge or supplement the remarks they make?

Mrs. BOUQUARD. Without objection, they will be included in the record.

Thank you.

[The opening statements of Messrs. Winn and Goldwater follow:]

OPENING STATEMENT
THE HONORABLE LARRY WINN, JR.
HEARING ON
COMPREHENSIVE NUCLEAR WASTE LEGISLATION
OCTOBER 5, 1981

THANK YOU, MADAM CHAIRMAN. I AM HAPPY TO BE HERE TODAY, AND I DO HOPE THAT THESE HEARINGS WILL FINALLY RESULT IN A HIGH-LEVEL WASTE MANAGEMENT BILL PASSED BY THIS CONGRESS. I HAVE LOOKED AT THE PROPOSAL BY OUR CHAIRMAN, MRS. BOUQUARD, AND MY COLLEAGUE, MR. LUJAN, THAT WOULD AUTHORIZE DEEP GEOLOGIC DISPOSAL OF GLASSIFIED HIGH-LEVEL RADIOACTIVE WASTE. I ALSO HAVE LOOKED AT OTHER LEGISLATION BEFORE US TODAY, SUCH AS MR. LUNDINE'S BILL, H.R. 1993. THE PROPOSAL THAT MRS. BOUQUARD AND MR. LUJAN HAVE OFFERED LOOKS TO ME LIKE A MAJOR STEP IN THE RIGHT DIRECTION TOWARD DEVELOPING SOME KIND OF CONSENSUS. IT SEEKS TO PULL TOGETHER THE BEST ASPECTS OF A NUMBER OF PROPOSALS. IT ALSO REPRESENTS AN IMPRESSIVE EFFORT TOWARD ENHANCING THE STATE AND THE NUCLEAR REGULATORY COMMISSION ROLES IN THE PROCESS OF DEVELOPING A HIGH-LEVEL RADIOACTIVE WASTE REPOSITORY. AT THE SAME TIME, THIS PROPOSAL OFFERS A STREAM-LINED LICENSING PROCESS. THE TRADE-OFF BETWEEN THESE TWO ASPECTS OF ANY NUCLEAR WASTE MANAGEMENT BILL MAKES THIS PROPOSAL ESPECIALLY ATTRACTIVE. WE NEED TO ENSURE THAT ALL THE CONCERNED PARTIES ARE INVOLVED IN THE DECISION-MAKING PROCESS. WE ALSO NEED TO MINIMIZE THE OPPORTUNITY TO HAVE THINGS TIED UP IN COURT, RESULTING IN NO SOLUTION TO THE PROBLEM.

OF COURSE, PEOPLE DIFFER ON WHETHER OR NOT NUCLEAR POWER IS AN ALTERNATIVE, BUT ALL AGREE THAT WHETHER OR NOT WE HAVE NUCLEAR POWER AS A MAJOR SOURCE OF ENERGY FOR THIS COUNTRY IN THE FUTURE, WE NEED TO DO SOMETHING RIGHT NOW ABOUT THE SPENT FUEL AND WASTE THAT ALREADY EXIST. THIS MATERIAL HAS THE POTENTIAL TO BE ONE OF THE GREATEST HAZARDS TO THE ENVIRONMENT AND TO THE PUBLIC HEALTH IF WE JUST LEAVE IT WHERE IT IS, AND DELAY THE DECISION ABOUT DISPOSING IT. AND SO I AM VERY ENTHUSIASTIC ABOUT THESE HEARINGS TO EXAMINE THIS PROPOSED LEGISLATION BECAUSE I THINK IT IS A STEP IN THE RIGHT DIRECTION.

ONE ASPECT OF THE BOUQUARD/LUJAN PROPOSAL WHICH MAKES IT ESPECIALLY INTERESTING IS THE FACT THAT IT REQUIRES THE UTILITIES TO PAY A CHARGE THAT WOULD COVER THE COST OF THE DISPOSAL OF THE WASTES OR SPENT FUEL AND TO CHARGE THAT IN THEIR RATE BASE. THIS WAY, THOSE WHO BENEFIT FROM THE USE OF NUCLEAR POWER AS THEIR ENERGY SOURCE, WILL BE THOSE WHO PAY THE COST.

I THINK THAT THE TIME IS LONG PAST FOR US TO COME UP WITH A HIGH-LEVEL RADIOACTIVE WASTE BILL AND I WANT TO CONGRATULATE YOU, MADAM CHAIRMAN, FOR YOUR HARD WORK IN MAKING THIS PROPOSAL. I UNDERSTAND THAT YOU HAVE TRIED TO TAKE THE BEST ASPECTS OF A NUMBER OF PROPOSALS TO ARRIVE AT THIS.

I AM LOOKING FORWARD TO HEARING FROM OUR WITNESSES TODAY BECAUSE I DO HAVE SOME MORE QUESTIONS THAT I WOULD LIKE TO ASK.

THANK YOU, MADAM CHAIRMAN.

Insert

Opening Statement
THE HONORABLE BARRY M. GOLDWATER, JR.
Hearing on
COMPREHENSIVE NUCLEAR WASTE LEGISLATION
October 5, 1981

Thank you, Madam Chairman. Every time I come to one of these hearings, I hear statements that we need to study the problems more. We may have already studied the issue to death. I have here two volumes. These are only a partial listing of publications related to geologic disposal of nuclear waste, but they include 11,922 publications. In times of tighter finances, I believe it is wrong for us to waste the public's money continually doing paper studies. It reminds me a bit of the classic professional student who stays in school getting one degree after another, all financed by his dadday. But in this situation, the radioactive wastes continue to pile up like bad debts.

When I introduced my bill, H.R. 1909, I wanted to provide a mechanism to demonstrate that we did have the technical capability to dispose of high-level radioactive wastes. The idea was that the decision-making process for the full-scale repository would be helped by a demonstration of our competence to deal with these wastes. My bill also provided some focused research objectives for the test and evaluation facility. I am pleased to see that the concepts of that bill have been incorporated into the proposal by Mrs. Bouquard and Mr. Lujan. The enhanced role of the Nuclear Regulatory Commission in the testing and evaluation phase will clearly increase the contribution of that facility in the licensing process for a full-scale repository. This raises my hopes that we will indeed have a full-scale repository in operation by the end of this century. With this note of optimism, I am eager to hear from our witnesses this afternoon. Thank you, Madam Chairman.

Mrs. BOUQUARD. We welcome you again, Dr. Brewer. If you would identify your associates and proceed with your testimony.

TESTIMONY OF DR. SHELBY BREWER, ASSISTANT SECRETARY FOR NUCLEAR ENERGY, U.S. DEPARTMENT OF ENERGY, ACCOMPANIED BY SHELDON MEYERS, ACTING DEPUTY ASSISTANT SECRETARY FOR NUCLEAR WASTE MANAGEMENT; JACK THEREAULT, ACTING DIRECTOR OF THE OFFICE OF PLANS AND EVALUATION; AND KERMIT LAUGHON, ACTING DEPUTY DIRECTOR OF NUCLEAR POWER SYSTEMS

Dr. BREWER. Thank you, Madam Chairman.

I would like to thank you first of all for the opportunity to appear before this committee on a matter which is one of the three or four or five major priorities of the Reagan administration in its nuclear strategy, that being the permanent resolution of the waste issue.

I'm accompanied today by Sheldon Meyers on my left, Deputy Assistant Secretary for Waste Management; on my immediate right, Jack Thereault, Acting Director of the Office of Plans and Evaluation; on my far right, Kermit Laughon, chairman of a task force which I appointed to develop a reprocessing policy.

I do have a formal statement for the record, Madam Chairman. I would submit that for the record at this time and beg your indulgence to speak extemporaneously for a few moments.

Mrs. BOUQUARD. Without objection, your prepared statement will be made a part of the record. You may proceed as you wish.

Dr. BREWER. Fine.

After several decades, the U.S. Government has yet to fulfill its responsibility to develop and deploy a coherent waste management system.

One of the problems is that the exact delineation of Federal and private responsibilities in high level waste management is not clear. Legislation, since and including the 1954 Atomic Energy Act, does not delineate clearly where and when in the fuel cycle high level waste becomes a direct Federal responsibility, although it is more or less understood that the Federal Government does have a responsibility for providing a permanent ultimate repository. Consequently, the waste management strategy over the past several decades has been toothless and has been subject to transient whims and fancies of past administrations.

In particular, the policies of the last administration tended to institutionalize and perpetuate the issue rather than resolve it. These policies emphasized endless examination of options, endless R. & D., and an open-ended schedule.

Your proposed legislation, Madam Chairman and Mr. Lujan, would tend to clarify the partitioning of responsibilities between the Federal Government and licensees who generate waste in nuclear power systems. We strongly support that element of your proposed legislation.

Your proposed legislation also has a very heavy schedule thrust. Anyone connected with the waste management issue over the years, either in the executive branch, Congress, industry or the utilities, has felt an urgent need for a firm, clear schedule for reaching closure on the technological and institutional issues and for making the solution operative in fact.

Again, we want to deploy the solution on a predictable schedule, not perpetuate the issue. And your proposed legislation lays down a schedule and a process. That is most welcome, although we may have some further detailed suggestions to make regarding the coupling of the test and evaluation facility schedules and that of the first repository. These are suggestions of a technical nature, and we'll coordinate with your staff on that.

Another area of uncertainty that your bill addresses is the role of State governments in siting waste management facilities. We oppose the prospect of a unilateral veto by State governments on siting waste management facilities or repositories. High level waste management is a national problem, and what is needed is a rational and fair process through which the concerns of States can be resolved in a national political forum such as the U.S. Congress. Your proposed bill provides such a procedure. Our only comment at this time is that we believe the Congress should have the opportunity to sustain a State objection by a joint resolution rather than by an act of either House.

Madam Chairman, this concludes my opening remarks. My colleagues and I will be happy to answer any questions you may have at this time.

[The prepared statement of Dr. Brewer follows:]

STATEMENT OF SHELBY T. BREWER
ASSISTANT SECRETARY FOR NUCLEAR ENERGY
U.S. DEPARTMENT OF ENERGY
BEFORE THE
COMMITTEE ON SCIENCE AND TECHNOLOGY
SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
U.S. HOUSE OF REPRESENTATIVES
OCTOBER 5, 1981

Madam Chairman and Members of the Subcommittee, I am pleased to appear before you today to present the Department of Energy's views on the emerging nuclear waste management policy and what we believe are essential elements of any related legislative initiatives. I will also offer some Departmental comments on the discussion draft of this Committee's comprehensive waste management policy bill and on H.R. 1993. We wish to work closely with the Congress to ensure that legislation which is ultimately passed will be consistent with the policy framework that I will outline today, and the authorizations we believe will be required. I am accompanied this afternoon by Sheldon Meyers, the Deputy Assistant Secretary for Nuclear Waste Management.

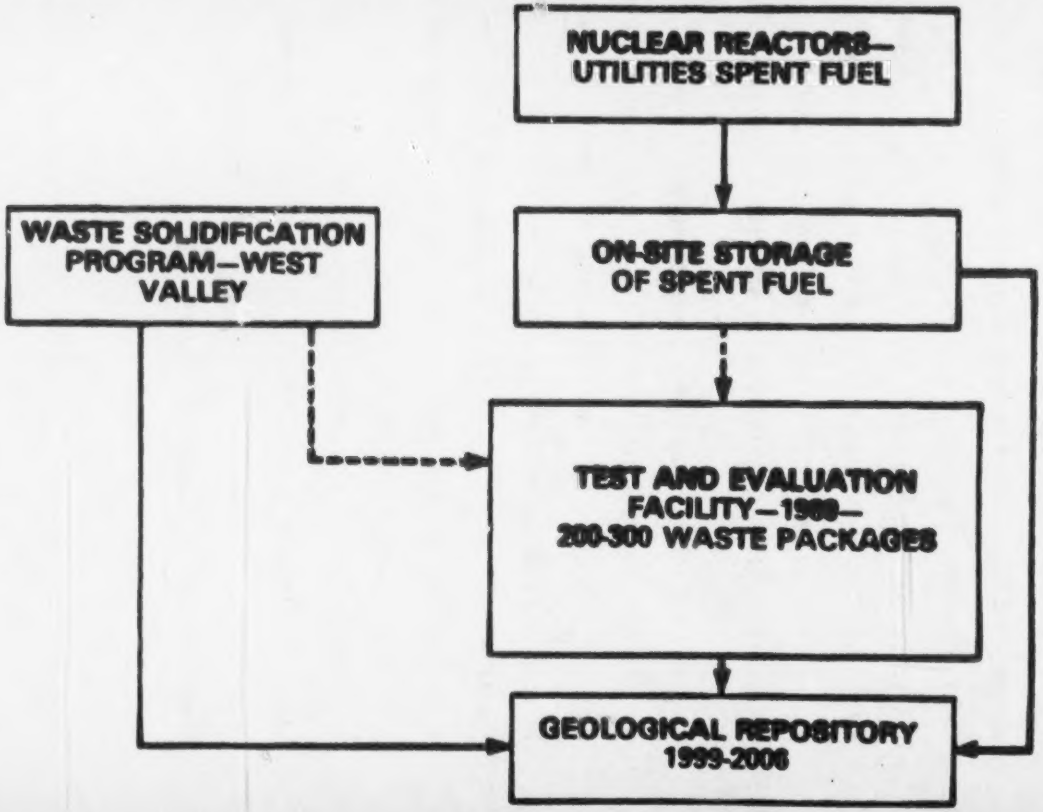
Current Nuclear Waste Management Program

Permanent Geological Repository and Test and Evaluation (T&E) Facility

The current Department of Energy program will identify three specific geological repository sites at which construction of exploratory shafts to depth will begin by 1983, to be completed by 1985. The three locations will likely be: in basalt flows on the Hanford site; in welded volcanic tuff on the Nevada test site; and, in a salt formation site to be determined by 1983. Following examination of the three sites at depth, selection of one of the three sites will be proposed for the development of a Test and Evaluation (T&E) Facility. This is currently scheduled for 1985. Parallel work on detailed site characterizations, necessary before a decision can be made on determining the site or sites to be used for a full-scale licensed repository, will continue at all three sites. A license application for the first repository is scheduled to be submitted to NRC by 1988, with operation to begin in the 1999-2006 timeframe. As we testified earlier this year, the repository would be capable of accepting spent fuel in addition to solidified high-level waste.

The T&E Facility will develop waste emplacement technology. The Facility will be designed for the placement of up to two to three hundred packages of high-level waste. The package will incorporate multiple barriers, will be completely monitored, and will be designed for retrieval. Methods for handling large quantities of waste packages will be developed. This technology will be used in the licensing process whether or not the first waste repository is located at the site of the T&E Facility. Further, it will demonstrate on a practical basis that high-level radioactive wastes can be handled and stored safely. If estimates are correct, radioactive materials could be emplaced in the T&E facility by 1989. Figure 1 depicts the current waste management program.

FIGURE 1
EXISTING WASTE MANAGEMENT PROGRAM


NUCLEAR REACTORS—
UTILITIES SPENT FUEL
ON-SITE STORAGE
OF SPENT FUEL
WASTE SOLIDIFICATION
PROGRAM—WEST
VALLEY
TEST AND EVALUATION
FACILITY—1988—
200-300 WASTE PACKAGES
GEOLOGICAL REPOSITORY
1999-2006

Comments on Subject Bills

Madam Chairman, I would now like to comment on the discussion draft of the Committee's comprehensive waste management bill. Since we received the draft only last week, we have not been able to complete the careful evaluation that this proposed legislation deserves. Consequently, we believe it would be inappropriate to offer extensive, detailed comments at this time. We can state, however, that our initial review indicates that large areas of agreement exist. Your carefully considered approach to the disposition of existing and future inventories of nuclear wastes indicates a basic compatibility with the policies and strategies that we are proposing.

There are several areas that the Department feels should be addressed in any comprehensive waste management bill. First, experience has shown us that there is a need for a formal mechanism to resolve differences that may arise between DOE and State authorities over the siting of high-level waste repositories. We have worked continuously to develop a program of consultation and cooperation with State authorities, but eventually a formal resolution of possible State objections to the siting of a repository will be required. The proposed comprehensive bill provides a mechanism, and our only comment at this time is that we believe the Congress should have the opportunity to sustain a State's or Tribal Council's objection by Joint Resolution.

Second, we believe clear authority is needed for the Federal Government to collect revenues and for the Secretary of Energy to expend funds as needed to meet early program financing requirements. The proposed bill contains several provisions in this area.

Finally, it should be clearly established that the Department will have authority to take title to high-level waste and spent fuel, and collect fees for disposal of such waste. This legislation provides the needed clarification.

In general, many provisions of the bill are very similar to programmatic initiatives which are well underway. Others provide needed clarification of authority. Although not totally consistent with current Administration policy, we acknowledge that the bill would provide a quantum step forward in providing program and policy stability.

We would be less than candid if we did not point out that the bill would require completion of activities within timeframes that are substantially shorter than those to which the waste program is currently geared. We will examine these new targets closely, with the objective of seeing what we can do to meet them. When we complete our in-depth analysis of all aspects of the bill, we will be happy to furnish the Committee with more detailed comments.

Finally, Madam Chairman, I will offer some brief DOE comments on H.R. 1993. This bill provides for a mission plan that embodies policies, programs, procedures and detailed information for managing high-level waste and spent fuel. The value of asking Congress to approve a detailed plan for a specific program is not clear. It would appear that congress, in its normal role of authorizing and appropriating for DOE programs, already has sufficient and adequate approval authority over the Department's activities.

Several provisions of the bill are very similar to programmatic initiatives that are already underway.

The format of the plan, apparently based upon similar plans prepared for the National Aeronautics and Space Administration (NASA), does not appear appropriate for the waste isolation program. Moreover, the specific requirements for items to be covered in the plan are most demanding for the timeframe in which the plan is to be prepared -- by January 1, 1982. In some instances the bill is asking for identification in the plan of the results of ongoing research and development programs and for information which will only be developed over a number of years. The timing requirement for incorporating in the plan changes resulting from a review prior to submission to Congress on March 1, 1982, seems unrealistic in light of the number of reviewers and the complexity of the plan.

We do not support the recommendation that a review and arbitration board be established to perform certain technical functions -- such as determining the adequacy of the engineering design and the designated waste forms and packages proposed for a given site. The proposed membership of the board, as described in H.R. 1993, indicates that most of the members would be unlikely to be qualified to make the required technical decisions. The functions in question are now being performed by the Nuclear Regulatory Commission, and we believe that they should remain with NRC.

This completes my statement, Madam Chairman. I will be pleased to attempt to answer any questions you may have at this time.

Mrs. Bouquard. Thank you very much, Dr. Brewer.

You touched briefly on the coupling of procedures. Do you believe the hybridized system for intergovernment licensing of the repository is appropriate, considering the fact that DOE and NRC are both separately responsible for protecting the public health and safety and then also considering the fact that DOE, being a Government agency, is not profit oriented and can, therefore, be trusted to design, construct, and operate the repository in the best interest of our country?

Dr. Brewer. Mr. Meyers?

Mr. Meyers. We think the idea of DOE and NRC working jointly is a very sound one. As you may know, we have been working for the past several years with the Nuclear Regulatory Commission in their early stages of developing their part 60 criteria. We see no reason why that should not continue into the future. Moreover, the concept of DOE developing criteria which are later confirmed by the NRC is also a technique that has worked in the past.

Mrs. Bouquard. Do you believe the exception for ex parte communications between the NRC and the Secretary is needed?

Mr. Meyers. Absolutely.

Mrs. Bouquard. Do you believe it would be helpful in terms of expediting action to have NRC closely involved in the DOE work before receiving the official license applications?

Mr. Meyers. Yes, indeed. As a matter of fact, we have been working in that mode. If the bill should pass into law, the idea of ex parte communication is something that would have given us a problem in the future, once the licensing proceeding starts. The ability to speak with the NRC——

Mrs. Bouquard. Would you state why you would need ex parte communications?

Mr. Meyers. As I understand the licensing process, once the licensing proceeding has started, everything has to be done in a fishbowl, and it's difficult to cite in the Federal Register when you're going to meet with people. Sometimes we pick up the phone and call an NRC staffer to confirm an approach being taken. I think it would just help smooth the process out considerably.

Mrs. Bouquard. You touched on the States' involvement, Dr. Brewer. Do you approve of the concept of fixed payments to the States, as in the Bouquard/Lujan proposal?

Dr. Brewer. Yes, Madam Chairman. I think that would be most helpful in securing a site in a particular State.

Mrs. Bouquard. You spoke of the role of the States in the consultative area. Do you feel the consultative role for NRC and the States—as we bring in the tribes, you know, this does affect the Interior Committee as well—will ultimately be helpful in completing the project in a more timely fashion? Do you think it's going to help or slow things down?

Dr. Brewer. Madam Chairman, it will involve a great deal of extra work on our part to coordinate closely with the States, but it's worth the effort. And I think with your formula for resolving the State and Federal issues with congressional action——

Mrs. Bouquard. You believe it should be both Houses?

Dr. Brewer. I believe a joint resolution would be preferable.

Mrs. **Bouquard**. What would you recommend for resolving the difficulties between NRC and the States—the DOE and the States, excuse me—a joint arbitration board to resolve the difficulties or an impasse between the States?

Dr. **Brewer**. Madam Chairman, as I understand your bill, if a site is selected by the Secretary and there is a State objection to that site, then 50 days are allowed for Congress—one House of Congress—to support the objection. If that is not forthcoming, then the decision by the Secretary stands.

Mrs. **Bouquard**. What I was referring to is the technical details before the actual site is approved for selection.

Dr. **Brewer**. Your bill also contains a process for technical concurrence and coordination and steady effort by the States.

Mrs. **Bouquard**. How would you resolve a difficulty that should arise between the States?

Dr. **Brewer**. During the site-selection process?

Mrs. **Bouquard**. During the early site selection, if it reached an impasse, do you have any specific recommendation?

Dr. **Brewer**. Before the actual decision but during the selection process? Mr. Meyers?

Mr. **Meyers**. The States that we work in generally designate their own staff for us to work with. Up to now, we have been fairly successful in overcoming the various concerns of the States. They will go over our plans and say to us that certain work is needed in certain areas, and we generally accommodate the requests of the States.

I can't think of an instance where the States asked us to do something that we didn't feel it was appropriate to do on a technical basis. It seems to me that the technical issues are a lot cleaner cut than the political ones in the siting of these facilities.

Mrs. **Bouquard**. Do you feel an arbitration board might be necessary to complete the repository by 1996.

Mr. **Meyers**. For technical matters?

Mrs. **Bouquard**. Yes.

Mr. **Meyers**. Probably not. The concept would involve our designating somebody and the State designating somebody and then both jointly selecting a third person. If you make an arbitration decision binding, then we get into a problem of a recommendation that we can't follow through on. We've found that the informal techniques do work, and barring an impasse, which we have not had, we would not recommend that kind of arbitration be set up.

Mrs. **Bouquard**. Thank you very much.

Mr. Lujan?

Mr. **Lujan**. Is that because if the arbitrators decide something that you didn't like, you'd have to abide by it, too? [Laughter.]

Mr. **Meyers**. No, Mr. Congressman. [Laughter.]

Mr. **Lujan**. It seems like we're pretty much in line in our thinking—start off with the T. & E. facility, and if that one proves out, take all the different ones where we did the test and evaluation, and the best one then becomes the permanent repository.

You have no objection with that sort of thing, I gather?

Dr. **Brewer**. No, sir. That is essentially our current plan.

Mr. LUJAN. But the State participation, you know, from the technical standpoint, you may be able to resolve all those questions. But don't forget that we have political problems at home.

What I envision is some sort of an agreement that could be reached between DOE and the State prior to its becoming a permanent respository. After all, you were able to do it in WIPP very easily.

I really don't see any problem to being able to work with the States. As a matter of fact, I think it's necessary to avoid political problems that we go ahead and take the concerns of the States into consideration.

There is one thing in here that perhaps is pretty tough, and that says that we'll work these agreements. But you cannot really object and bring it to the Congress until such time as you're designated as the permanent repository. There's no sense in having all of these procedures while you're just in the test and evaluation part.

Then we have another provision in there that says that NRC and DOE work together during this whole process, so that it doesn't come as a complete surprise, so to speak, to NRC at the time that we're going to ask for licensing.

It seems to me that the process, everybody working together, as you move toward that one crucial point and at that one crucial point, you say, "OK, let's shoot it out now and see who wins"—I suppose that's it.

Let me ask you something that we've had a little problem with over in the Interior Committee, and that's on the role of Indian reservations in this whole thing.

There seems to be too much concentration, as far as my thinking is concerned, on Indian reservations. Are there any sites that are even remotely being considered within an Indian reservation that we have to be so very careful about it?

Mr. MEYERS. Not right now, but it could happen in the future.

Mr. LUJAN. That's kind of the wrong answer. What I really wanted is, "Not right now."

Mr. MEYERS. We have a program that will be looking at different geologic media in the future. And the same courtesy we afford the States ought to be afforded the Indian nations, if we're working on their territory.

Mr. LUJAN. In other words, kind of consider them like a State—the same provisions that apply to the State.

Mr. MEYERS. Yes, sir.

Mr. LUJAN. But you have no presently identified sites within Indian reservations. You mentioned what—Hanford and the Nevada test site and salt domes, wherever they may be? So basically the answer is no, bringing it right back around.

Mr. MEYERS. Not at this time.

Mr. LUJAN. One other definition of waste should be considered, in some of the proposals it says just the spent fuel rods or what's reprocessed. Our definition is a little wider. It could include materials out of West Valley, materials out of Three Mile Island, or the equivalent that's used for reprocessing.

In your view, which is the preferred definition?

Dr. BREWER. Mr. Lujan, the definition, as stated in the bill that you and Mrs. Bouquard proposed, is appropriate. Our preferred ultimate waste form, of course, is reprocessed high level waste, not spent fuel. However, there will be some spent fuel that will probably end up being permanently disposed of in a repository.

Mr. LUJAN. You mean other than spent fuel?

Dr. BREWER. No, sir. We may just take some spent fuel that's unsatisfactory for reprocessing for some reason or other and dispose of it in a repository. We would hope that that fraction would be very, very minimal. Our plan nationally is ultimately to go to reprocessing and dispose of waste as solidified waste from the reprocessing plant.

Mr. LUJAN. Do you think we'll be at that point, addressing what Mr. Lundine was talking about a little while earlier, that we confront the reprocessing issue? We have not done so in this legislation, figuring that that's really a separate subject that we ought to look at.

But is it the Department's eventual goal to put into permanent repositories only—I shouldn't say only—primarily reprocessed waste? Or are you looking at the spent fuel rods without reprocessing as being in the permanent repository?

Dr. BREWER. Primarily, Congressman, our hope would be that the major fraction of the waste would be high-level reprocessed waste. Quite frankly, it's up to the utility that the spent fuel belongs to whether they reprocess it or not. They may elect to dispose of the spent fuel in that form. But we would hope that that would be a very minor fraction of the national disposal capacity.

Mr. LUJAN. If the Federal Government builds a repository—and I understand all the things that the private sector ought to pay for, the storage, and eventually pay for it—but assuming that it is the Federal Government that is operating the repository, do you believe it should or can or would be optional on the part of the utility to be able to say, "Well, I want this reprocessed", and so therefore we can put that in the repository, or "No, I don't want it reprocessed. Let's put in in the repository like that."

Do you think the utility ought to have that option?

Dr. BREWER. The Federal Government, as the owner of the repository, should accept waste in whatever form it comes, provided it meets the criteria for safety and environmental impact and so on, be it reprocessed solidified waste or other.

Mr. LUJAN. That's a new wrinkle. I never thought of it. You know, I just assumed either we would put all reprocessed waste or the spent fuel rods in.

Dr. BREWER. It depends on who has title to the waste as it goes over into Federal repository property. That is one of the observations I made in my opening statement. That delineation is not entirely clear from the legislative history of this business.

Mr. LUJAN. I hadn't even thought of it, to be honest with you. Thank you, Madam Chairman.

Mrs. BOUQUARD. Thank you very much, Mr. Lujan.

Before we proceed, I understand that there are people who would like to take photographs and recordings in today's sessions. Without objection, such photographs and recordings will be permitted.

Mr. Wolpe?

Mr. WOLPE. Thank you, Madam Chairman.

Dr. Brewer, I'd like to focus on two different questions. One is the distinction between demonstration on the one hand and research and development on the other.

My second line of questioning leads to the distinction between the test and evaluation facility on the one hand and the perimeter repository on the other.

We're currently spending approximately $200 million per year on nuclear waste research and development. There have been some that have contended that we have yet to achieve a scientific consensus as to the most appropriate technology to utilize for the permanent disposal of nuclear waste materials.

Do you believe that our research and development program should be focused upon demonstrating available technology that's been identified, or should we continue research and development to develop new and potentially more effective technologies?

Dr. **Brewer**. Mr. Wolpe, my own personal view—and I do speak for the Department on this—is that we are able now to select the appropriate technology for waste disposal. It's in hand, and we can proceed to demonstrate it.

I don't believe that we need to look at another 3,000 options. We must maintain a schedule and get on with solving the problem.

Mr. **Wolpe**. How would you characterize the $200 million that are presently invested in the research and development effort of the Department of Energy? Are all those dollars being spent on demonstration, or is a portion of them being spent on the exploration of alternative technologies?

Mr. **Meyers**. Most of that money is going into site characterization and preliminary designs of facilities, getting ready for licensing. Some of it is going into research and development, but the lion's share of it is going into site characterization.

Mr. **Wolpe**. Why are we investing any amount in research and development?

Mr. **Meyers**. There are still some minor unknowns having to do with such things as, how do you plug a bore hole to pass a licensing proceeding? How do you develop a model for radionuclide migration that will withstand a licensing proceeding? Remember, none of these things has ever been done.

Part of our problem is that while we technically feel we can do the job, there is still a formal licensing proceeding that we have to go through to prove again in a public forum that the repository will perform as indicated.

Mr. **Wolpe**. You lost me just now. If we already know the answers to that, why do we have any money invested in research and development other than—just to meet the licensing requirement? If you know the answers, you don't need to have money invested in research and development; do you?

Mr. **Meyers**. The answers in terms of how you package the waste and how you put it into the ground are well known. What we need information on is the variety of rock formations we're involved in, how the waste form interacts with those rocks, should there be a breach in the repository some number of years in the future, how water that would come by would pick up the radionuclide, what kind of retardation the geologic media will provide. These are the kinds of things that the research money is being spent on now.

Mr. **Wolpe**. Aren't those rather basic to the question of how we proceed in the area of nuclear waste material?

Mr. **Meyers**. When you say basic, I don't know what you mean by that.

Mr. **Wolpe**. Aren't there still a lot of questions to be answered, I guess?

Mr. **Meyers**. It's a matter of doing it. We have experiments underway in each of those areas. And again, the reason I brought up the NRC licensing proceeding is that that is the ultimate forum in which someone says yes or no. You must be able to prove to their satisfaction that you know what you're doing.

Dr. **Brewer**. Mr. Wolpe, it's confirmatory in nature. It's not as if we're blind on all of these data and all of these issues. We do have the models. We have quantified the problem in the mathematical sense.

The research and development that he's speaking of is to get the right coefficients in the equations in order to be able to prove before a licensing board that what we say will happen, will happen.

Mr. **Wolpe**. Could I switch, then, to this last set of questions related to the test and evalution facility?

I'm trying to understand a bit more clearly the relationship between the test and evaluation facility contemplated in the legislation. I have not yet had an opportunity to really examine the language within the legislation on the one hand and the perimeter repository on the other.

Is it your view that the test and evaluation facility should, in fact, be convertible into a permanent repository, first of all?

Mr. **Meyers**. Our feeling is that it should not be precluded from that, not necessarily that it should be or that it can be, but not precluded. In other words, once we have a test and evaluation facility in place, we would like not to have any law that says you can't use it for a repository. But we're not saying now that it should be converted to a repository.

Mr. **Wolpe**. In what respect should the criteria used in the identification of the test and evaluation facility be different from those kind of criteria that would be applied to the identification of a permanent repository?

Mr. **Meyers**. Right now it's the same criteria. In other words, our current plan calls for the characterization of a number of sites, three sites. We intend to select the test and evaluation facility from one of these three sites. It will have been subjected to the same criteria as the repository.

Mr. **Wolpe**. And presumably the same set of safety and public health and other related issues that are raised with respect to the perimeter repository are raised, then, with respect to identification of the test and evaluation facility?

Mr. **Meyers**. The answer is yes. But a test and evaluation facility would be a much smaller operation. We would certainly use the same health and safety criteria as we work that particular facility.

Dr. **Brewer**. There is one fundamental difference, sir. That is that the waste in the T. & E. facility will be fully retrievable.

Mr. **Wolpe**. Would you suggest--could you just clarify for me—and this will be my last question, because I don't want to exceed my time—is the Department of Energy trying to obtain generic information concerning the technology needed to handle waste? Or are you really attempting through the test and evaluation facility to obtain site-specific geological information?

Mr. **Meyers**. The test and evaluation facility will be designed to provide generic information that will be useful for any repository.

Mr. **Wolpe**. Thank you.

Mrs. **Bouquard**. Thank you very much.

Mr. Lundine?

Mr. **Lundine**. Thank you.

In your prepared statement, you commented on a couple of provisions of the bill I introduced, H.R. 1993, but did not give us the benefit of your comments on the remaining provisions, and I'd like to ask you a few questions about that.

Do you agree that our plans for a research and development facility should be integrated into a planning process for the development of a permanent disposal facility?

Dr. **Brewer**. Yes, sir, and it is now. In the Department of Energy, we cannot plan the permanent repository, the full-scale repository, without integrating that plan with the T. & E. facility.

Mr. **Lundine**. That leads me to a question, sort of an aside.

What's the status of your national plan begun in the last administration?

Mr. **Meyers**. The national plan included the entire waste management program of the Department. As you know, we have had a change in the program in the sense of it being split up. Right now the staff is going through the plan to orient it toward the commercial sector.

Mr. **Lundine**. But if the R. & D. phase is virtually complete, as you've testified before, it shouldn't be too difficult to produce a plan.

When do you expect to have one completed?

Mr. **Meyers**. We have not got a date on when such a plan will be completed, primarily because the new administration has not focused on the plan itself.

Mr. **Lundine**. Well, I can't understand an answer to a question that says, yes, it's fully integrated into the planning process, but, no, we don't have a plan and we don't know when we're going to have one.

Mr. **Meyers**. The requirement for the so-called national plan, as you may recall, came out of the deliberations of the interagency review group from the last administration. We have not had an opportunity to surface the concept of that same kind of plan in the new administration.

Mr. **Lundine**. Didn't you testify in May or thereabouts, whenever it was we previously held hearings on this subject, that you were working on a plan? I'm not quarreling with changing the IRG report; in fact, I guess I would support changing some of the recommendations of that report. But it just seems to me that if you're going to integrate something into a plan, you've got to have some general plan to integrate it into.

Mr. **Meyers**. From a program operation point of view, we think the idea of having an integrated plan that lays out not only the roles of the Department of Energy but the Nuclear Regulatory Commission and EPA is a good idea.

What I'm saying to you is that we have not had an opportunity to sound out the new administration with regard to putting out such a plan.

Mr. LUNDINE. Second, do you support the creation of a repository trust fund to finance the implementation of a permanent disposal facility?

Dr. BREWER. I think the financial mechanism, sir, or the funding should be borne by the beneficiaries of nuclear power through either contracting with the utilities and the Department of Energy or, as is proposed on the Senate side, a one mil per kilowatt-hour tax on the nuclear utilities.

Mr. LUNDINE. Third, do you support the idea of impact payments to States where repositories are located and operated?

Dr. BREWER. In my opinion, yes, sir. However, this view does not necessarily represent the administration's position on this subject.

Mr. LUNDINE. Fourth, what is the policy of the Reagan administration with regard to spent fuel and nuclear reprocessing? You go into that a little bit in answer to a previous question. But do you contemplate that there will be reprocessing and that only a minor portion, at the option of the utility, of spent fuel would be used for these disposal facilities?

Dr. BREWER. The Reagan administration strongly supports reprocessing as an element of the total nuclear strategy. As you know, the administration has also indicated that reprocessing is the appropriate role of the private sector.

We are now in the process of trying to determine the financial, regulatory, and institutional environment in which reprocessing could occur as a private sector venture. You'll recall that two of the three attempts at commercial reprocessing in this country have failed, largely due to policy instability and regulatory instability.

Mr. LUNDINE. Do you support the commercial demonstration of dry storage technology for onsite utility storage of spent fuel?

Dr. BREWER. Yes.

Mr. LUNDINE. On page 5 of your written statement and in answer to a previous question, you raised an objection to an arbitration board as a mechanism to resolve possible Federal/State conflicts on nuclear repository siting before the application goes to the NRC on the basis that such a board would not have technical expertise. Yet in your testimony here today, you said that the technical matters are clear cut.

My question is, Do you think that Congress has the necessary technical expertise to make such a judgment, and do we in Congress have that technical expertise which an arbitration board, partially composed of Congressmen and partially composed of other appointed people by the President, would not have?

Dr. BREWER. Congressman, I believe that the problems facing waste management, the waste management strategy and the waste management program, are not entirely technical in nature. They are institutional and political in nature and should be resolved in a political forum.

Mr. LUNDINE. Well, that's just the point. As Mr. Lujan jokingly said, isn't there a necessity to come to some final resolution of these things? And where there really is State and Federal difference, wouldn't it be best to have some mechanism which could resolve it with a certainty and which would have some indication or some design to having been fair about the whole question?

Dr. **Brewer**. Congressman, the proposal of the chairman and Mr. Lujan, I believe, is eminently fair. There is an opportunity for a State objection to be sustained by Congress, in which case the site is abandoned.

Mr. **Lundine**. And your reason for supporting that is, rather than having some kind of arbitration, is essentially you believe that political judgment can best be made by Congress and that it's a political question, rather than some alternative group that wouldn't have the technical expertise?

Dr. **Brewer**. I would not have political judgments made by anything other than those expert in political matters.

Mr. **Lundine**. Thank you.

Mrs. **Bouquard**. Thank you very much.

Mr. Goldwater?

Mr. **Goldwater**. Dr. Brewer, following up on the discussion on the question that Mr. Lundine raises, I was led to believe that technically we have not arrived at a time where we can make a decision. Yet you interject the question of politics.

What do you mean?

Dr. **Brewer**. I think we're near the point of making technical decisions as to the waste form, whether its borosilicate glass or whatever, and what type of canister it's appropriate to put that waste in, and the thermal hydraulics of different geological media.

The decisions confronting us, which are much larger in nature, are where are those repositories and can they be politically obtained?

Mr. **Goldwater**. Does the politics only have to do with site location?

Dr. **Brewer**. In my view, that's the major obstacle.

Mr. **Goldwater**. So you're saying, technically we have the knowledge to make a decision or we're close to it.

Dr. **Brewer**. Yes, sir.

Mr. **Goldwater**. But that the sensitivity of that location or locations does not involve technology or technical knowledge but involves overcoming objections by a State or some other institution that is more of a political nature than a technical one and thus must be addressed by elected representatives?

Dr. **Brewer**. Yes, sir, that's exactly what I mean.

Mr. **Goldwater**. What is currently being done at the Nevada test site? Did you review that briefly, and could you maybe supplement it later?

Dr. **Brewer**. Yes, sir, we'll be happy to.

At the Nevada test site, there's a facility there called Climax, and we have a number of spent fuel rods in place there. We're taking data on the temperature distribution and water migration and all that.

Perhaps I'd better have Mr. Meyers answer the question.

Mr. **Meyers**. It's that, but we are also checking radiation effects on that particular geologic rock, which is granite. Additionally, we have another facility nearby called the Engine Maintenance and Disassembly (EMAD) Building, where we do packaging work. Additionally on the Nevada test site itself, one of the proposed sites for the geologic repository is being investigated, as well as a rock material called volcanic tuffs. And we expect in 1983 to be able to decide whether or not that would be a suitable site to sink an exploratory shaft in.

We have several things going on in Nevada. One is investigation as a possible location for a geologic repository. We have the Climax stock, which is 1,500 feet underground in granite where we have placed 11 spent fuel elements and 26 electrical heaters in which we are collecting data for generic information on granite. And that's about it for Nevada.

Mr. GOLDWATER. Are you doing similar work at Hanford, and could you go through that?

Mr. MEYERS. At Hanford, we have similar work to this degree. We are exploring in one of the basalt rock formations there, the possibility of a geologic repository. We have something called the near-surface test facility, which is similar to the Climax stock, except it's built into the side of a basalt mountain. I believe it's about 400 feet underground.

We don't have spent fuel in that particular facility, just electrical heaters, and we don't have a packaging facility similar to the EMAD there. In fact, the packaging facility in Nevada is used to package the material that would have gone into the near-surface test facility.

Mr. GOLDWATER. Where else in the United States are you doing similar work?

Mr. MEYERS. There's a salt mine in Louisiana called Avery Island where we have electrical heaters in the ground. We do not have radioactive material similar to the Climax stock elsewhere.

The Avery Island information is of generic interest to salt. I think that covers it.

Mr. GOLDWATER. What is your estimate of the possible cost of the facilities in this particular proposal? How does it compare with the existing program underway?

Mr. MEYERS. Do you mean the test and evaluation facility when you say "the facility"?

Mr. GOLDWATER. You have an ongoing program right now with estimated costs, I assume. How does that compare to the estimated costs of carrying out this?

Mr. MEYERS. I would guess that the bills on the ongoing program are fairly similar in terms of their ultimate cost. We don't have accurate cost figures on building a repository or the test and evaluation facility. But the quick estimates we got, based upon the limited amount of work that we've done, would indicate that a test and evaluation facility would cost on the order of $150 or $200 million, and the ultimate cost of building and operating a repository would be a couple of billion dollars over its lifetime.

Mr. GOLDWATER. A couple of billion?

Mr. MEYERS. Over its lifetime. But again, those are very tentative figures based upon incomplete information.

Mr. LUJAN. If the gentleman would yield? You say "over its lifetime", but what about the building of it? When you're going to build a repository, you're not talking about operating it for thousands of years.

It's one thing to say $2 billion, but to build it——

Mr. **Meyers**. We will have to supply this information for the record. The construction costs will be on the order of $800 million, something like that. But I'd prefer to get a more accurate figure for you for the record.

[Information to be furnished follows:]

The estimated costs for a repository are summarized in the table below. This estimate is based on an average of four available repository cost estimates in bedded salt, domed salt, basalt, and granite, and assumed spent fuel as the waste form. A similar estimate for reprocessed high-level waste is currently under preparation by the Department.

Facility capacity (MTU)	[1] 68,462
Maximum receipt rate:	
MTU per year, first 5 years	1,800
MTU per year, subsequently	6,000
Costs (rounded):	
Construction (million)	$980
Capital equipment and operating [1] (million)	$1,740
Decommissioning (million)	$150
Cost base year	$1,980
Source	ONWI

[1] Assumes maximum MTU's received each year.

Mr. **Goldwater**. Dr. Brewer, would an intermediate scale facility, as proposed in Mr. Lundine's bill, add additional costs or additional burden? Justifying the costs, how do you see that playing into this total program?

Mr. **Meyers**. When you say "intermediate scale facility", are you talking about the test and evaluation facility, because that's what's in the bill—the test and evaluation facility?

That is part of the administration's program right now, and it should not add any more to the current estimates of cost.

Mr. **Goldwater**. Do you believe that we need another State planning council, an interagency review group, as proposed by H.R. 1993?

Mr. **Meyers**. I do not. I do not think that an interagency review group would be productive, based upon my experience with the last one, and I do not think that we need another State planning council. There are existing mechanisms in place now, such as the National Governors Association, the National Council of State Legislatures, where we can get the kind of generic information affecting State governments that we may need.

I see no particular reason to set up an entirely new body.

Mr. **Goldwater**. Do you think that the schedule called for in this bill, 1993, is feasible? And if not, why not?

Mr. **Meyers**. Which bill?

Mr. **Goldwater**. H.R. 1993.

Mr. **Meyers**. That's Mr. Lundine's bill?

Mr. **Goldwater**. I'm sorry. The chairman's proposal. It doesn't have a number yet. The proposal of Mr. Lujan and Ms. Bouquard.

Dr. **Brewer**. The chairman's bill, I believe, if we work the arithmetic out right—would have the repository coming on line in 1996. Is that right? And that's doable.

Mr. **Goldwater**. Thank you, Madam Chairman.

Mr. **Lujan**. What about the 1999 2006 estimate?

Dr. **Brewer**. That is the current waste management plan. Mrs. Bouquard's bill and your bill, if you add up the schedule in the bill itself—and we did it this afternoon—you get a 5-year acceleration overall.

Mrs. **Bouquard**. I believe, Dr. Brewer, you have about 5 minutes left before you have to leave. We certainly appreciate your patience this afternoon.

I'd like to recognize Congressman Lowery.

Mr. **Lowery**. Thank you, Madam Chairman.

Dr. Brewer, what volume and sources of concentrated waste are available for the facility now? What would you envision would be available in 1987 when the bill calls for the testing and evaluation facility to be available and 1995 when it's a full-scale repository?

Mr. **Meyers**. Right now we have some 600,000 gallons of liquid high level waste up in West Valley, New York, which is commercial waste. As you know, last year Congress passed a law that obliges the Department of Energy to solidify that waste. That waste will generate about 200 to 300 canisters of high level waste which could be utilized in the test and evaluation facility.

We have approximately 7,000 metric tons of spent fuel at various locations around the country. And should we have reprocessing, that will likewise generate large quantities of liquid waste. I don't recall the gallon amount right now.

Mr. **Lowery**. And by 1987—you're saying these are today's quantities and sources?

Mr. **Meyers**. We can get you the amount of spent fuel that will be generated by 1987. It's not clear how much that will convert into liquid waste. But we do have projections of the spent fuel to be discharged from reactors.

Mr. **Lowery**. And if you can also get me those figures by 1995 as well.

Mr. **Meyers**. Sure. 1987 and 1995.

Mr. **Lowery**. When we're going to have the test and evaluation facility and then final siting and how much you expect all the total need for disposal to be met through this approach.

[The information follows:]

By 1987, we project that we shall have approximately 21,570 metric tons of spent fuel on hand. By 1995 we project approximately 50,700 metric tons. The test and evaluation facility is currently scheduled for operation by 1989 and the full-scale licensed repository is scheduled for operation in the 1999–2006 time frame, depending on the geologic media selected. By the year 2000, we project the following inventories to be available: Defense programs—335,000 cubic meters; and 72,000 metric tons uranium contained in 252,000 spent fuel assemblies. Assuming reprocessing of this spent fuel, the resulting quantity of high-level waste can be accommodated by the facilities currently planned.

Mr. **Meyers**. The test and evaluation facility will be a limited facility where 200 to 300 canisters of waste will be placed in a retrievable mode. The repository itself will be the final resting place for the remainder of the waste.

Mr. **Lowery**. All the waste that's generated in the country?

Mr. **Meyers**. That's right.

Mr. **Lowery**. What is your estimate of the possible cost for the facilities called for in this bill?

Mr. **Meyers**. That question was asked before, and just guessing, it would be on the order of a couple of billion dollars. But I think it would be much better if we could get that for you for the record.[1]

Mr. **Lowery**. How does the chairman's program compare with what you have envisioned at DOE previously?

Mr. **Meyers**. It's very similar. And as Dr. Brewer said earlier, we feel quite sanguine about it.

Mr. **Lowery**. Finally, probably the most difficult question is, How do you see interfacing with the NRC? The bill calls for exempting everything from the environmental impact statement except the final siting. How are we going to handle that environmental impact statement exemption? Is that going to fly politically, realistically?

Mr. **Meyers**. As I recall the bill, it provides that the impact statement developed by the Department of Energy will be the same one that will be used by NRC in the licensing process, and I personally see absolutely nothing wrong with that.

Mr. **Lowery**. But it is a full-fledged environmental impact statement?

Mr. **Meyers**. Oh, absolutely. We will provide a full-scale environmental impact statement for the siting of that repository. And I think the only difference is that the NRC——

Mr. **Lowery**. But how about everything prior to the final siting of the facility?

Mr. **Meyers**. Well, we will be going through environmental analyses all along. And unless the bill provides an exclusion from the requirements of the act, we will obviously follow the act.

One thing I recall in this particular bill that I thought was a very good idea was the EIS generated by the Department to be used by the Nuclear Regulatory Commission as well. We're talking about the same facility, and that just makes sense to me.

Mr. **Lowery**. For the testing process as well as final siting for disposal.

Mr. **Meyers**. You mean the test and evaluation facility? We will do an environmental analysis of the effects of that facility, and whether or not an impact statement is needed, I couldn't say at this time until we do that analysis.

Mr. **Lowery**. OK, that's my question. It strikes me that's where a great deal of the controversy is going to surround.

I commend you for the approach. The sooner we can bring this on, the better. But realizing some of the political problems that we've been experiencing most recently in California with the little nuclear facility there, I'm curious as to how viable this kind of streamlined approach is going to be.

Thank you very much, Madam Chairman.

Mrs. **Bouquard**. Thank you very much, Mr. Lowery.

We have one final quick question from Mr. Lundine.

Mr. **Lundine**. You talk in figure 1 here about using the West Valley solidified waste in the first test and evaluation facility.

Do you have ample authority under existing law to take title to those solidified wastes for research and development purposes?

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[1] This information is given in the table which is inserted on p. 300.

Dr. BREWER. No, sir. The reason the line in the figure is dotted is because that's meant to indicate a possibility.

Mr. LUNDINE. Thank you.

Mrs. BOUQUARD. Thank you very much, Mr. Lundine.

Dr. Brewer, we certainly thank you and your distinguished associates for being with us for your valuable testimony and your time this afternoon. Thank you, sir.

Dr. BREWER. Thank you, Madam Chairman.

Mrs. BOUQUARD. Our next witness is Dr. Thomas Cotton, Senior Analyst, Office of Technology Assessment.

We welcome you, Dr. Cotton, and look forward to your testimony. Your written statement will be incorporated in the record without objection. You may summarize and proceed as you wish.

TESTIMONY OF DR. THOMAS COTTON, SENIOR ANALYST, OFFICE OF TECHNOLOGY ASSESSMENT, WASHINGTON, D.C.

Dr. COTTON. Madam Chairman, I am the Project Director of the Office of Technology Assessment's study of commercial high level radioactive waste management in the United States. I've been asked to present OTA's comments and perspectives on the key elements of the waste disposal program as well as OTA's views on the desirability of recommended changes to the proposed legislation.

I would like to briefly describe some of the main conclusions that have emerged from OTA's study thus far. I will limit my oral remarks today to our view of the basic elements of a comprehensive radioactive waste management policy. Our comments on the key provisions of the legislation that you are considering are contained in my written testimony, and I would be glad to answer any questions that you may have.

We would also like to submit for the record a more detailed analysis of the legislation within several weeks, if that would be acceptable.

Mrs. BOUQUARD. Without objection.

Dr. COTTON. The evidence is clear that not until about the mid-1970's did the Federal Government begin to devote substantial attention or resources to the problem of nuclear waste management. The waste management effort has in general been characterized by a number of fundamental ills, including: Sharp and sudden shifts in policy, the low priority placed upon the program at the agency and departmental levels, inadequate resources—both in money and people—from year to year; general institutional instability and the failure to adequately address the concerns of States and others.

As a result, there is today a widespread lack of confidence that the Federal Government can or will manage high level radioactive wastes safely and efficiently and at a rate and scale commensurate with projected levels of nuclear power generation.

The deepest and most consuming doubts concern not so much the technology for disposal—the disagreement there centers on the feasible rate of technology development rather than on the choice of the technology—but rather the institutional capacity of the Federal Government to carry out, over a period of 20 years or more, the difficult and sustained effort required to both build and operate a disposal system capable of handling large amounts of high level radioactive waste.

In addition to these public doubts concerning the waste disposal effort as a whole, the utilities with nuclear reactors are facing two critical uncertainties: first, as spent fuel continues to pile up, reactors are running out of storage space and may have to shut down unless more storage space is made available on a timely basis; and second, utilities are facing an open-ended responsibility for growing inventories of spent fuel with no idea of when or how or at what cost that fuel will finally be disposed of.

To resolve both the public's and the utilities' uncertainties about how, when, and whether high level radioactive waste can and will be finally and safely disposed of is the goal that a successful waste management program must be designed to meet. The single greatest obstacle to such a program is the severe erosion of public confidence in the Federal waste management effort.

In citing the past flaws and failures of the waste management program, we do not mean to suggest that no significant progress has been made—it has—or that any burden of blame must fall upon the shoulders of the many dedicated and competent people who have carried out that program. The problem has not been the quality of the people involved, but rather the tasks they have been called upon to perform with what until recently were meager resources and very difficult circumstances. Indeed, it has been the hard work of the staff and laboratories at the Department of Energy, the Nuclear Regulatory Commission, the Environmental Protection Agency, the U.S. Geological Survey, and other agencies that has laid the very firm groundwork for the commitment contained in the legislation that this committee is considering. Many of the necessary analytical tools and data that were only under development at the time we began our study are now ready to be applied to the task of developing a management action program.

I would also like just to state for the record, Madam Chairman, that throughout the course of our assessment we have enjoyed the active and willing cooperation of all these agencies. I would like to take this opportunity to express our thanks for their help, without which we could not have done our own work.

When OTA began its study, we were encouraged by this committee and by OTA's Congressional Board to take a comprehensive view of the waste management problem and to identify, if possible, the sequence of decisions and actions which could lead to the development of an operational high-level radioactive waste management system. During the 3 years we have devoted to the subject we have sought and analyzed a wide range of views from the technical community, program personnel in the involved Federal agencies, the nuclear industry, the environmental community, State and local officials, and the lay public.

As a result of that effort and the technical and institutional studies performed during the course of our assessment, we have identified what we believe to be the basic elements of an integrated commercial high-level radioactive waste management policy that would be responsive to the key concerns of the affected parties. None of the individual elements of that policy are new. They have all been considered at one time or other. Some have been incorporated into bills introduced in the Congress, including the bills that you are considering today. Some have been, or are now, part of administration policy.

We believe, however, that the policy we will discuss forms a cohesive set of interdependent and mutually supportive elements which, taken together, could form the basis for the broad and stable consensus needed to break the current stalemate and get on with the job of radioactive waste management. Other policies could conceivably achieve the same ends; however, we have concluded from our analysis that the integrated policy that we will outline is in its main elements capable of securing the credibility, stability, and broad support that are the essential ingredients for a successful radioactive waste management policy.

The elements of the policy we will describe have been selected on the basis of a single principle: in waste management perhaps even more than in other matters, Murphy's Law is likely to reign supreme. If anything has gone wrong in the waste management program in the past, it is likely to do so again, unless specific measures are adopted to prevent it. And the public tolerance for further mistakes has worn extremely thin. The cost of future failure could be quite high.

OTA has concluded that an integrated, comprehensive commercial high-level waste management program would contain six key elements:

First, a firm commitment in law to develop a regional system of mined geologic repositories on a realistic schedule; to accept waste from utilities beginning on a specified date, by which the first repository is intended to be available; and to accept in the meantime limited amounts of spent fuel from those utilities that are unable for technical reasons to provide their own interim storage capacity.

This commitment by the Federal Government to have a permanent disposal system ready to begin receiving waste on a specific day in a specific year is, in our opinion, the linchpin of the policy. Without such an unambiguous national commitment, there is simply no compelling reason to get the job done. The remaining five elements are those that we believe are necessary to make such a commitment both feasible and credible.

Second, rapid development by the administration, and approval by the Congress, of a credible and binding management action program that spells out the technical and institutional actions and milestones that must be accomplished, the contingencies that must be planned for and the financial and managerial resources that will be needed to deliver on those commitments.

Third, creation of an institutional mechanism to insure that the financial and managerial resources needed to carry out the management and action program will be available over the long time period required to fulfill the commitment, independent of competing short-term priorities of the Federal Government. One possible model would be an independent, self-financing public corporation funded by direct user charges, such as the Tennessee Valley Authority.

Fourth, establishment of an oversight process that can assure the Congress, the directly affected parties, and the American public that the responsible agency will be held accountable for the safe, efficient, and timely implementation of the management action program—while at the same time providing the independence from the uncertainties of the annual Federal budget process that the agency will need to carry out its mission. Congressional approval of a detailed management action program, to be implemented by an independent agency subject to annual oversight rather than to annual budget control, could play an important role in balancing independence and accountability.

Fifth, development of a regulatory process that makes ample allowance for the first-of-a-kind nature of high level radioactive waste disposal technology.

Sixth, explicit provision in law of those measures—such as a formal role in repository siting decisions, and perhaps impact compensation—that are needed to deal adequately with the basic concerns of the States that will be affected by the Federal waste management activities.

Mrs. BOUQUARD. Excuse me, Dr. Cotton, I think we're going to have to recess here for about 10 minutes for a vote, and then you can resume your testimony.

[Recess.]

Mrs. BOUQUARD. The subcommittee will come to order.

Dr. Cotton, before you resume your testimony, I'd like to address a question to Mr. Meyers, if I may at this time.

I understand that you provided testimony to the Interior Committee in regard to this legislation. I wonder if you'd be so kind as to provide this committee with a copy of that testimony for the record.

Mr. MEYERS. We'll be delighted to.

[The information mentioned follows:]

House Committee on Science and Technology
October 5, 1981
Witness: Sheldon Meyers
Page 61, Line 1446

Statement of Kenneth Davis
Deputy Secretary of Energy
Before The
Subcommittee on Energy and the Environment
Committee on Interior and Insular Affairs
U.S. House of Representatives

July 9, 1981

Nuclear Waste Management Legislation

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you today to present the Department of Energy's comments on Title I of your bill, H.R. 3809, and four other nuclear waste management bills introduced during this Congress, namely: H.R. 1993 (Lundine); H.R. 2800 (Oakar); H.R. 2840 (Huckaby); and H.R. 2881 (Derrick). I am accompanied by Dr. Shelby Brewer, the Assistant Secretary for Nuclear Energy and Dr. Colin Heath, the Director of the Office of Waste Isolation.

I would like first to express our appreciation for the interest and support of this and other committees in the Congress in achieving a more effective approach toward radioactive waste management. The concern with which this issue is viewed is reflected in the numerous pieces of legislation which have been submitted this session. With your permission, Mr. Chairman, I would like to provide a frame of reference for our comments on the cited legislation by briefly outlining the Administration's evolving nuclear waste management policies and describing the key features of the Department's proposed program strategy for isolating high-level radioactive waste.

The Integrated Fuel Cycle

Before discussing the specifics of the evolving waste management policy, it is useful to walk through the current and prospective backend of the nuclear fuel cycle and to place the waste management program in this broader context. Again, I hasten to point out that the Administration has not as yet settled on the specific details of the closure of the fuel cycle. To complete the formulation of our technical and institutional policies will require careful consideration of several factors.

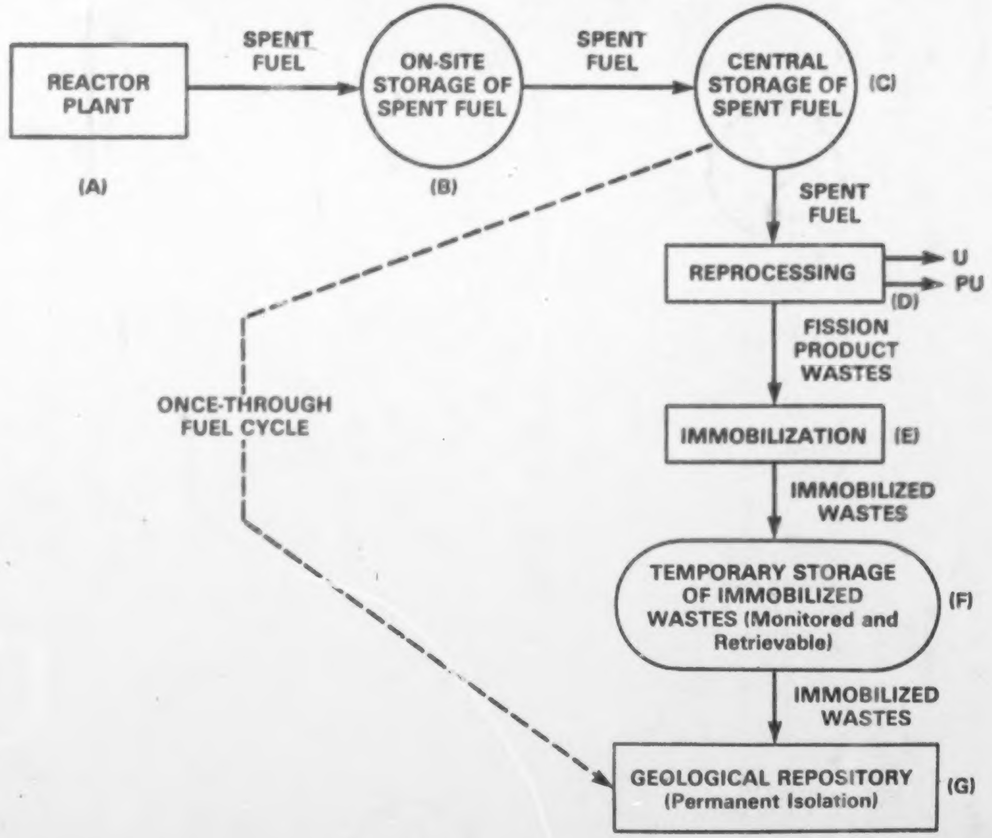
The backend of the nuclear fuel cycle should be regarded as an integrated system, as shown in Figure 1. Waste management is one element of this system.

Spent fuel discharged from a reactor core (A) is stored for some period of time at the reactor site (B). To date the U.S. has not gone beyond this step, and some on-site storage pools will be full by the mid-1980s. This spent fuel storage congestion represents a very real, near-term concern of many utility companies. The possible steps beyond on-site storage are prospective -- that is, facilities to accomplish those steps do not presently exist.

Beyond on-site storage of spent fuel, a temporary measure at best is the possibility, if logistics require, of centrally located spent fuel storage facilities to accommodate more than one reactor.

FIGURE 1

"CLASSICAL" FUEL CYCLE WITH REPROCESSING


REACTOR PLANT
(A)
SPENT FUEL
ON-SITE STORAGE OF SPENT FUEL
(B)
SPENT FUEL
CENTRAL STORAGE OF SPENT FUEL
(C)
SPENT FUEL
REPROCESSING
(D)
U
PU
FISSION PRODUCT WASTES
IMMOBILIZATION
(E)
IMMOBILIZED WASTES
TEMPORARY STORAGE OF IMMOBILIZED WASTES (Monitored and Retrievable)
(F)
IMMOBILIZED WASTES
GEOLOGICAL REPOSITORY (Permanent Isolation)
(G)
ONCE-THROUGH FUEL CYCLE

Reprocessing is the next prospective step (D). Reprocessing mechanically and chemically separates the incoming spent fuel into three output streams: uranium, with a residual energy value; plutonium, with a residual energy value; and a stream concentrated in fission product "wastes". The term "wastes" may, indeed, be a misnomer; there is a significant body of opinion in the scientific community that several of the fission product species may have economic applications. For the moment, for simplicity in our discussion, let us retain the word "wastes".

Step (E) is the immobilization (or solidification) of the waste stream. There are several candidate forms for the solidified wastes: for example, borosilicate glass, SYNROC (synthetic mineral), tailored ceramics, and high silica glass. Several of these processes have been demonstrated on a laboratory scale, and some have been scaled to operational practice abroad. Immobilization, we believe, will certainly be an element of the reprocessing complex. Transportation of high-level wastes in liquid form is not allowed by the Nuclear Regulatory Commission.

Prospective step (F) is an engineered facility to store, retrievably, immobilized wastes until an ultimate disposition system in a natural geological formation is available. This step would provide a logistical "surge" capability against the possibility of a delay in finding a politically acceptable method of permanent isolation of high-level wastes from the biosphere. We are impressed with the

French approach: reprocessed wastes are immobilized and these immobilized wastes are stored in a retrievable facility until such time as geologic disposal is available.

Finally, the last step is ultimate separation of immobilized high-level waste from the biosphere. Major candidate media are geological formations known to be seismically stable for millions of years.

What I have just described is a chain of steps designed to maximize flexibility of choices in the future, allow for logistical contingencies, and conserve our nuclear reserve base. It is a strategy envisioned by the pioneers in the nuclear community decades ago and sustained in principle, if not in detail, by both Democratic and Republican Administrations.

Another possibility is the policy of the previous Administration which established as a reference strategy the once-through fuel cycle. This is shown in dotted lines in Figure 1. In this plan, residual energy values were not to be recovered but irretrievably disposed of. Reprocessing was banned. Civilian immobilization technology development was banned.

The waste management program that we are proposing differs markedly with the previous Administration's program. Although this Administration's waste management policy has not been finalized, the approach proposed by the

Department is a logical extension of the 30 years of research and development that was carried out by the Atomic Energy Commission and its successor agencies and is in continuity with the waste management programs of the rest of the world.

We believe that the cornerstone of the waste management program should be that the reference waste form, as it was prior to the Carter Administration and as is in concert with the rest of the world, is reprocessed high-level waste. While the previous Administration's approach of using spent fuel as the reference waste form may have been technically achievable, we believe that reprocessed waste results in a more desirable waste form from the standpoint of long term stability. In addition, it will permit the recovery of the substantial unused energy values in the fuel. The waste will be similar in nature to the considerably larger volume of defense waste and can benefit from that parallel developmental program. Further, it is our intent to demonstrate the permanent storage of high level radioactive wastes as soon as possible.

National reprocessing capability is key to the formulation of our high-level waste program and the President has gone on record as favoring reprocessing by the nuclear industry. We believe it can enhance our ability to successfully demonstrate that we can effectively deal with the waste management problem. By separating out the principal long term concern--plutonium, converting the waste to a solid form and then placing it in a very stable, immobilized form, such as glass, we can go far toward demonstrating that we can effectively handle radioactive waste and prepare it for permanent storage. The temporary storage of such solidified wastes at or below the earth's surface will lend further credence to availability of an effective solution. It could also serve as a valuable contingency plan should difficulties occur in development of an acceptable permanent repository. As our policy crystallizes, we will be providing you with additional information on our decisions and plans.

There are several other areas in which significant policy redirection has taken place. The Terminal Isolation Program which focuses on step G of Figure 1, has been reoriented to provide an earlier focus on actual alternative site locations. Since waste isolation is a major interest in the bills under consideration, I would like to outline the strategy that DOE currently proposes to implement. I believe you will agree that many of the initiatives and objectives in the DOE plan are similar to those provided for in the proposed legislation.

1. Focus on specific sites -

   DOE proposes to identify three specific sites at which construction of exploratory shafts to depth would begin by 1983. As a result of the technical status of the program, these three locations will likely be:

a. in basalt flows on the Hanford site in the State of Washington.

b. in welded volcanic tuff on the Nevada Test Site in the State of Nevada.

c. in a salt formation at a site to be determined by 1983.

The Department is currently conducting investigations of salt domes in the Gulf Interior Region of Texas, Louisiana and Mississippi and bedded salt in the Paradox Basin in Utah and the Permian Basin in Texas. In 1983, it is anticipated that a decision can be made whether to develop an exploratory shaft in bedded or in dome salt.

2. Underground characterization -

The sinking of exploratory shafts at the three sites should begin in 1983 and our present plans call for completion by 1985. Examination and in-situ testing will be conducted to determine the potential suitability of each site for a permanent disposal facility. The Administration assigns a very high priority to this field work as it lies near, or on, the "critical path" of progress toward a permanent disposal facility.

3. Selection of one site for a test and evaluation facility -

Following examination of the three sites at depth, selection of one of the three sites for the development of a test and evaluation facility will be made. This selection is currently scheduled for 1985. Parallel work on detailed site characterization, necessary before a decision can be made on determining the site or sites to be used for a full-scale licensed repository, will, of course, continue at all three sites.

The test and evaluation facility will be designed for the placement of up to two to three hundred packages of solidified high-level waste. The packages will incorporate multiple barriers, will be completely monitored and will be designed for retrieval. Methods for handling large quantities of waste packages will be developed and experience will be gained in keeping worker exposure to radiation as low as reasonably achievable.

The purpose of the test and evaluation facility, accordingly, is not for extended site characterization at a favored site; this will continue at all three sites in parallel, in any event. The test and evaluation facility will develop waste emplacement technology; this technology will be used in the licensing process whether or not the first waste repository is located at the site of the test and evaluation facility. Further, it will be demonstrated on a practical basis that high-level radioactive wastes can be handled and stored safely.

4. Construction and operation of a test and evaluation facility - It is currently estimated that design of the facility will require two years and that underground construction will require two more years. If these estimates are correct, radioactive materials could be emplaced in the facility by 1989.

5. Submission of a license application to NRC for the first repository - The first license application for a full-scale repository can be submitted to NRC when two technical conditions are satisfied.*

   a. a minimum of three sites in two rock types have been investigated with exploratory shafts; and

   b. data are available to conduct the predictive modelling of the waste package, repository performance and interactions with the geology that would be required by NRC in a licensing review.

If necessary funding is forthcoming, these conditions could be met by 1987 or 1988, after more detailed site characterization data have been collected and the necessary technology development completed. NRC review of a license application could be conducted in parallel with further development of the test and evaluation facility.

During the development of the test and evaluation facility, investigation of other sites will be continued. Measurements at the site of all three exploratory shafts will continue as required. Furthermore, by approximately 1988, it is anticipated that sufficient information will have been collected concerning the salt formation not chosen as one of the first three sites with exploratory shafts and concerning possible locations in granite to allow construction of additional exploratory shafts. Maximum flexibility has been built into the program to allow decisions to be made at a later time concerning the submission of the first license application to the NRC.

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*This discussion is restricted to technical conditions. No assumptions have been made about conditions of State acceptance.

Longer term evaluation of diverse geology and supplementary concepts such as sub-seabed disposal will be continued. State participation and regulatory oversight, as appropriate, will be an integral part of the program.

We believe that implementation of the strategy I have just described is the best path for achieving the goal of a safe and technically sound waste isolation system. As I said previously, we also believe that it will achieve many of the objectives set forth in the cited proposed bills.

Need For Additional Legislation

DOE is continuing its assessment of the type of legislation, if any, that is desirable for conduct of our waste isolation program. Should the Administration determine that legislation is desirable, we would anticipate submitting proposed legislation during the early months of the next session of Congress.

Most of the authority and much of the institutional structure for implementing our waste management strategy are already in place. DOE's responsibilities for waste management are specified in existing legislation and the Department has developed its plans for a system of safe permanent repositories for the long term isolation of radioactive wastes. We have conducted a detailed review under the National Environmental Protection Act, issued a detailed Environmental Impact Statement, and published a formal decision to emphasize the development of mined geologic repositories for the permanent disposal of the wastes.

In addition, the authority of the Nuclear Regulatory Commission (NRC) to license and regulate the construction and operation of geologic repositories is clearly established in law. NRC has issued procedural regulations, as parts of 10 CFR 60, and is preparing to issue for public comment proposed technical rules to govern the licensing of these facilities. Thus, specific procedures and limitations for full-scale permanent repositories are being developed under existing authority. The Department's programs will be conducted in compliance with the procedural regulations of NRC. While we have specific reservations about certain of the proposed technical rules governing licensing, we intend to interact closely with NRC prior to their issuance in final form.

In view of the framework that is already in place, I would caution against legislative action to establish mandatory schedules, to impose arbitrary restrictions on facility capacities or use, or to prescribe additional layering of responsibilities.

There are two areas, however, where legislative guidance may be useful in fulfilling the objectives of our terminal isolation program, although we are not prepared at this time to make specific recommendations. Otherwise, we believe sufficient authority exists for the Department to continue the program I described. First, experience has shown us that there is a need for a formal mechanism to resolve differences that may arise between DOE and State authorities over the siting of high-level waste repositories. We have worked continuously to develop a program of consultation and cooperation with State authorities, but eventually a formal resolution of possible State objections to the siting of a repository will be required.

Second, impacts upon communities near to a proposed repository site represent a significant issue in gaining acceptance by the public and local communities. Authority for the Secretary to negotiate with State and local governments over impact-mitigating measures is being considered by the Department.

With regard to our specific comments on the subject bills, we have analyzed them in considerable detail and an analysis of each is provided for the record. We have also submitted for the record answers to the questions raised by the Committee in its letter of June 4, 1981.

As a final note, Mr. Chairman, we are concerned that several of the bills fail to distinguish between the management of defense and commercial waste. We believe, for national security reasons, that any bill that evolves should be primarily directed to the disposal of civilian wastes. Defense Programs activities should not be subjected to control by an independent regulatory agency.

This completes my testimony Mr. Chairman. I shall be pleased to attempt to answer your questions at this time.

ANALYSIS OF NUCLEAR WASTE LEGISLATION

Title I, H.R. 3809. This title consists of Subtitle A - High Level Waste Repositories and Subtitle B - Low Level Waste. I shall confine my comments to our concern about the timing provisions of Subtitle A and then address Subtitle B.

In Section 112 of Title I, we are required to identify two sites considered suitable for characterization by January 1, 1982, and two more by February 1, 1985. It might be possible to meet the first requirement by selecting sites on existing DOE reservations, such as Nevada and Hanford, but to do so in such a short time would violate the finding in the bill that calls for State involvement in such a decision with adequate time for consideration of information. If one or both of the sites were identified on non-DOE lands, we probably could not hold the required public hearings before the January 1, 1982, deadline.

Identifying two more sites by 1985 would necessitate four sites at which shafts would be sunk prior to a decision to license. We propose that three alternative sites with shafts would be sufficient to allow proceeding with license application to the NRC.

We agree with the conclusion in Section 112 that site identification for characterization is preliminary decisionmaking only and not a major Federal action.

The restrictions proposed in Section 113 for site characterization and test facilities do not seem necessary or desirable. For example, the limitation not to exceed the curie equivalent of 10 metric tons of spent fuel has no technical basis of which we are aware.

Subtitle B proposes several changes to the Atomic Energy Act regarding the management of low-level radioactive waste. While most of the changes relate to NRC, I can offer comments on those aspects which affect the Department of Energy or on which our position may be of interest.

Several changes to Section 274 are in line with our policy. DOE, as well as other groups such as the National Governors Association and the State Planning Council, has strongly supported requiring States to adopt NRC standards for low-level waste management and to assure that State licensing procedures are equivalent to those of NRC. Consistency in these areas will be valuable. We also support requiring that a State transfer adequate extended care funds to the Federal Government if the site is to become the long-term responsibility of the Federal Government.

Similarly, we support proposed changes to Sections 83, 84, and 161. Better controls over low-level waste disposal sites in the post-operational period can be as important as the attention given to sites while they are receiving waste for disposal. Consistency in the license terms and conditions during operations and at license termination is valuable.

Close involvement of both NRC and the Environmental Protection Agency (EPA) is necessary in determining the possible colocation of radioactive and hazardous waste disposal sites. Giving responsibility to NRC for the development of regulations for the disposal of the radioactive waste at the hazardous waste site is appropriate.

H.R. 1993. This bill provides for a mission plan that embodies policies, programs, procedures and detailed information for managing high-level waste and spent fuel.

This mission plan apparently is based upon similar plans prepared for the National Aeronautics and Space Administration (NASA). A preliminary review of NASA mission plans, however, does not indicate that their format would be particularly appropriate for the waste isolation program. Moreover, the specific requirements for items to be covered in the mission plan, delineated in Title I, are most demanding for the time frame in which the mission plan is to be prepared--by January 1, 1982. For example, there is a call for "an identification of all scientific and technical information that must be available" and also "an evaluation of financial, political, or institutional problems which might impede the development of the solution to the problem of the disposal of radioactive waste." Essentially, the bill is asking for identification in the mission plan of the results of the ongoing research and development program and for information which will only be developed over a number of years. For example, specific technical standards which will have to be met to comply with the technical requirements of NRC are still being developed and will not be available for several years.

On page 11, the proposed bill calls for the mission plan to be reviewed by the State Planning Council, a new Interagency Review Group and NRC, and for their comments to be received and changes made so that the plan can be submitted to the Congress by March 1, 1982. Requiring review by this many groups and revision within a period of 60 days appears impossible for this detailed a plan.

Finally, the value of asking Congress to approve a detailed mission plan for a specific program is not clear. It would appear that Congress, in its normal role of authorizing and appropriating for DOE programs, already has sufficient and adequate approval authority over the Department's activities.

There does not seem to be any need for the proposed Section 102. The Department already has the necessary authority to build facilities of the type identified in Section 102 and has done so, for example at the Climax Facility in Nevada. The requirement to not place more than forty metric tons of spent fuel or its equivalent seems to be unnecessary, and we question why such a limit should be imposed.

Section 103 speaks to intermediate-scale repositories. It seems that such a facility would be comparable to the proposed Test and Evaluation Facility which the Department has under consideration.

In Section 104, an independent review and arbitration board is established which would perform certain functions as defined in the title. Specifically, on page 21, this board is to determine the adequacy of certain activities, such as the engineering design and the designated waste forms and packages proposed for a given site. This function is presently assigned to NRC, and it seems inappropriate to establish a separate layer of bureaucracy in order to make determinations which are already allocated to a prescribed technical agency. Further examples of functions which, in our opinion, should remain solely with NRC can be found on page 22 of the bill.

The description of the proposed membership of the review board, contained in Section 105, indicates that most of the members are likely to be unqualified to make the technical decisions required in Section 104. We believe these technical findings should remain the responsibility of NRC.

Section 108b calls for an assessment of the economic and other impacts of a waste isolation program on communities, and empowers the Secretary to determine ways in which they could be mitigated. Section 109 provides a way in which such payments can be made from a trust fund set up for the purpose of waste management. This trust fund will come directly from those who seek to dispose of waste materials. As stated earlier, a Departmental review is currently underway to assess the desirability of such authority.

The DOE considers that establishment of an Interagency Review Group, as called for in Section 111, is not necessary. Such coordination can be achieved through the Secretary of Energy, and through the interagency coordination process within the Executive Office of the President.

In Title I, the bill requires that a lump sum will be paid by the fuel owners to the Secretary to cover disposal costs. Some flexibility, particularly for fuel already discharged, would be desirable. Also, the proposed procedure discussed in Section 109 infers that the total liability is not known until the fuel enters the repository. This long-term liability of unknown magnitude may make it difficult for the utilities to collect from the present ratepayers the necessary funds to cover disposal.

That part of Title II, Section 202, which requires the Federal Government not to subsidize commercial reprocessing lacks clarity. It is not clear to what degree this precludes any Federal research and development activities on commercial reprocessing of spent fuel.

In Section 202, the description of the required terms of the agreement between the Department and the utility is not clear. It states that the Department will pay 75 percent of the cost to design and construct a dry storage facility for spent nuclear fuel, but the nature of the technical assistance by the Department is not specified. Also, the value or use of existing equipment at the reactor site is not considered.

Finally, the Administration now considers that Federal away-from-reactor storage facilities, authorized by this bill, are not required.

H.R. 2800. This bill addresses nuclear power reactor safety and the siting of nuclear waste facilities. Our comments are confined to the sections dealing with the management of radioactive waste, specifically the sections which cause us concern.

The related findings in Section 2 are unsupported. The requirement for DOE to provide satisfactory assurances that a tested technology has been developed is not defined. No tests are specified by which DOE could satisfy this requirement. The Department has filed detailed and comprehensive information with the NRC concerning technology development in the NRC's proceedings on a proposed rulemaking on waste management, and other participants have failed to identify substantive reasons why the Department program will not successfully develop safe permanent geologic repositories within a prescribed time frame. We are currently proposing a program leading to a near-term demonstration of the technological requirements.

The DOE is not considering storing nuclear wastes in geologic formations of unproven stability. The Department has proposed and is conducting studies to determine the suitability of specific geologic formations. The suitability of any formation cannot possibly be determined unless these investigations are conducted.

In Section 5(g), the Secretary of Energy--through a proposed amendment to the Energy Reorganization Act of 1974--is enjoined not to construct any nuclear waste disposal facility within or near densely populated areas. No definition of a densely populated area is given.

H.R. 2840. This bill embodies many of the policies and provisions of S. 637 which was also introduced earlier this year. It provides for a high level waste system that would include long-term disposal in a monitored, retrievable storage facility, and permanent disposal in a mined, geologic repository. If enacted, the DOE would be given authority to establish a Federal away-from-reactor program and substantial spending authorization to back up the program.

This bill limits the definition of a safe repository to a natural or man-made tunnel or cavern in the side of a mountain. This definition appears to exclude underground geologic repositories and is thus unacceptable to the Department.

Some of the provisions of Title III are contrary to Administration policy. The bill proposes a Federal away-from-reactor storage facility for commercial spent fuel. In its submission of the fiscal year 1982 budget, the DOE has recommended discontinuing efforts to provide Federal spent fuel storage. Spent fuel storage program activities to support acquisition of interim storage facilities will be redirected to concentrate on the development of technology to increase utility storage capabilities.

Title III also specifically calls for the Federal government to take title to spent fuel at power plants and to transport the fuel to Federally-owned and operated facilities. It should be noted that the bill calls for the Secretary to contract for this transportation activity with the private sector and to pay the private sector for this service out of monies collected from the utility. The DOE does not favor this provision on the basis that it is not necessary for the government to take over the private sector's responsibility, since they are quite capable of handling the transportation of radioactive materials.

In Section 307 there is a requirement that the Secretary take action to move fuel within 30 days of being notified by the owner that the fuel is available for movement. We question the need for such short notification. To comply with this provision, it would be necessary to have a number of shipping casks and transportation vehicles on hand which might be used only several times during the year.

Title V calls for the trust fund concept for supporting radioactive waste management. I wish to defer further comment on such a concept until the Department has an opportunity to study this matter in greater detail.

H.R. 2881. This bill, like H.R. 1993, H.R. 2840 and Title I of H.R. 3809, contains provisions for establishing licensed repositories for transuranic and high level radioactive wastes and spent fuel. It also provides a role for States and Indian tribes in the decisionmaking process. Our primary concerns with this proposed legislation are as follows:

In Section 2 spent fuel is broadly defined as fuel withdrawn from a nuclear reactor. It infers that defense generated spent fuel falls within the services of this bill, which we assume is not intended. We further believe that "site screening" should be defined.

The proposals contained in Section 104 of this bill--and again in Title I of H.R. 3809--concerning public hearings, proposed reports describing repository design, and procedures for the NEPA process are compatible with DOE's proposed program.

In Section 201 of Title II, the bill proposes that the Department should pay the cost of designing and constructing dry storage facilities. We believe that the costs for such facilities should be shared by both the utility and DOE. The requirements for licensing dry storage facilities, covered in Section 202, are already addressed in the NRC regulations in 10 CFR Part 72, issued last year.

High-Level Waste Repository Site Characterization

Q.1) What level of thermal loading--i.e., how many thermally "hot" canisters (either radioactive waste or heaters) of material--is optimum for the accomplishment of activities necessary to determine the suitability of a repository site for high level waste disposal? To what extent, and for what reasons, is it necessary to use radioactive materials for this specific purpose?

A.1) The number of "hot" canisters that might be needed to test the thermal-response characteristics of a specific site will depend upon the geologic type and characteristics of the site. It may well be that placement of canisters will not be required to measure the suitability of a site but may be required to complete the design of the repository to accommodate properly the thermal stresses that will be imposed by the placement of heat-emitting wastes.

The Department has proposed the development of a test and evaluation (T&E) facility to provide the capability for conducting generic engineering-type tests. In order to resolve engineering and other technical issues to support final decisions regarding full-scale facility design, licensing, and construction, it is currently envisioned that a few hundred canisters of high-level waste should be emplaced in the T&E facility. The exact quantity of waste needed will be determined by the specific technical areas to be addressed in the test program. For example, issues such as radiological exposure to workers, synergistic effects of radiation, handling techniques representative of full-scale operations, an in-situ waste package component fabrication and performance can be evaluated only with representative high-level waste. Design studies to determine the exact scope of these tests and preliminary design of the T&E facility are scheduled during FY 1983.

Concurrent with T&E activities, work necessary for determining repository site suitability will be conducted as part of the detailed site characteristics program planned for each potential repository site.

Q.2) What precautions are necessary or advisable in order to protect a site being used for test and evaluation purposes for future licensing for permanent high-level waste disposal?

A.2) The Department believes that activities associated with the T&E facility can be accomplished within the requirements spelled out in NRC's 10 CFR 60 licensing rules. The Department intends to provide information to NRC as specified in 10 CFR 60 to allow the site to continue to remain a candidate for a licensed repository.

Q.3) Should test and evaluation activities be conducted at more than one potential repository site?

A.3) Presently available information does not suggest a requirement to do this. The Department currently anticipates that the generic engineering issues can be resolved through conduct of a T&E program at only one site. Test activities necessary to determine site suitability are planned as part of the detailed site characterization phase at each potential repository site and are independent of the T&E test program.

Q.4) What is the optimum duration of test and evaluation activities prior to termination of the test or application for repository licensing?

A.4) As the details of the T&E program are not completely defined, the Department cannot specify at this time when the test program could be considered complete. It is anticipated that the program will be conducted for several years to obtain as much technical information as possible to feed into later decisions on full-scale facilities.

Q.5) What is the proper role of the public and the States with respect to conduct of test and evaluation activities?

A.5) The role of the States and public with respect to the T&E facility will be similar to their roles in the current repository siting efforts. These siting efforts and associated decisions are being coordinated with the involved State(s) in accordance with mutually agreed to procedures. Implicit in these agreements is the prospect that siting efforts may eventually lead to a repository. A T&E facility now becomes an alternative or additional possible outgrowth of these siting efforts and will need to be factored into future consultations. In view of the fact that a T&E facility would be limited to R&D and all emplaced materials will be fully-monitored and retrievable, we do not believe that the formal appeals to Congress concerning the siting of a repository should be applied.

Q.6) Should test and evaluation activities be conducted at repository depth at a site which would be prohibited from being expanded following the tests and licensed for permanent high-level waste disposal?

A.6) To develop a test and evaluation facility at a site that is deliberately disqualified from possible development for a full-scale licensed repository would not be a prudent expenditure of funds. The Department wishes to maintain the option of locating the test and evaluation facility and the initial waste repository at the same site, and plans to take sufficient care in the location of the test and evaluation facility to preserve this option.

Interim Spent Fuel Storage

Q.1) Should temporary storage of spent reactor fuel be the responsibility of utilities generating the fuel or should it be part of the Federal waste management program and the responsibility of the Federal Government?

Q.1) The Administration believes that the temporary storage of spent reactor fuel should remain the responsibility of utilities generating the fuel. By establishing clear and decisive nuclear energy policies and programs, the Administration hopes to facilitate utility and industry efforts to provide the necessary facilities and services to manage their spent fuel.

Q.2) Should spent reactor fuel be stored at reactor sites or in centralized storage facilities?

A.2) We believe fuel could be stored safely either at reactor sites or in centralized storage facilities. Maximum use of storage at reactor sites would reduce transportation requirements and avoid the need to establish a new, independent storage site.

Q.3) What steps can be taken to encourage and expedite licensing and construction of increased interim spent fuel storage capacity at reactor sites?

A.3) Several alternative technologies exist for increasing interim storage capability, including fuel rod consolidation, dry storage in casks, dry well storage, and silo storage. Although alternative storage technologies appear to be feasible, their demonstration and licensing must be accomplished before widescale implementation will occur. By participating in several demonstrations and by providing assistance in developing the data and information needed to license alternative storage technologies, the Federal Government can expedite the development of increased interim storage capability by utilities.

Q.4) At present there is a de facto indefinite deferral of spent fuel reprocessing in the United States. What impact does this situation have on interim spent fuel storage problems? How can the uncertainties affecting requirements for interim spent fuel storage capacity best be addressed?

A.4) With the existing industry uncertainties about the economics of commercial reprocessing in the United States, utilities must plan for greater interim spent fuel storage capacity. One way to address the uncertainties affecting interim storage requirements is to focus on technologies and storage methods which are suited to small incremental increases in capacity. For example, the dry storage in casks or in caissons is not facility or capital cost-intensive like water basin storage. A utility using these dry storage concepts could commit to small increments of storage capacity at a time and continually review the development of reprocessing or disposal capability. The construction of a number of additional small water basins is far more expensive than either the small dry storage increments or a large water basin. However, a commitment to a large water basin could result in significant underutilization of that capacity if reprocessing were to become available within 10 years.

Q.5) Are utilities which generate nuclear spent fuel capable of providing interim fuel storage capacity adequate to assure safe handling of the spent fuel pending initiation of permanent waste disposal or spent fuel reprocessing?

Q.5) Yes, While some utilities do face more urgent or larger spent fuel storage needs, all the utilities should be able to provide adequate storage capacity to assure safe handling of spent fuel. Although further reliance on transshipment of spent fuel between reactor sites and limited operation without full core reserve capacity will be necessary in some cases, we believe that it can be done in a safe manner and that temporary reliance on these contingencies is warranted until additional capacity is available.

Long-term Storage of High-Level Waste or Spent Fuel

Q.1) Would cooling of high-level waste or spent fuel for periods of up to 40 years or more prior to permanent disposal in deep geologic repositories increase the operational safety of such repositories? Would long-term cooling improve the economies of disposal? What is the optimum time period for cooling of radioactive materials prior to deep geologic disposal, with regard to safety and economic considerations?

A.1) While it is true that reduced temperatures from interim storage could reduce the thermal stresses if the spacing remains unchanged, the Department does not believe that cooling of waste for extended periods of time would significantly increase the operational safety of repositories. Operational safety would be enhanced only if there were some type of massive thermally-induced failure mechanism of the repository host rock that would be mitigated at lower temperatures. Such a failure mechanism has not been established for hard rock and thermally-induced creep in salt can be accommodated simply by initially oversizing or maintaining the size of all openings in the salt.

As high-level waste cools, the quantity of these materials that can be emplaced in a given repository area increases somewhat. However, any cost savings realized by the increased capacity would most likely be offset by increased storage costs prior to disposal of the wastes in the repository. For example, the utilities currently have a limited onsite storage capacity and to extend cooling of spent fuel beyond perhaps 15 years would require additional onsite capacity or a system of offsite storage facilities. Thus, with regard to safety and economic factors only, there does not appear to be an optimum time for waste cooling prior to disposal in a geologic repository.

Q.2) It has been proposed that the waste management system include at least one engineered facility for storage of wastes in a retrievable manner for periods up to or longer than 100 years. Would such a facility or a series of such facilities be acceptable indefinitely as a method of disposal of high-level nuclear wastes? Would such a facility provide greater safety than deep geologic disposal? Would such a facility be easier to site and construct than deep geologic facilities? What would such a facility or series of facilities cost?

A.2) The issue of monitored retrievable storage is currently being addressed in the Department's terminal isolation program as requested by the FY 1981 Appropriations Conference Report. The Department will be submitting a report, following study completion by October 1981, which will provide preliminary information on design configurations, approximate costs, possible nationwide siting and the impact on the total waste management system.

The long term acceptability of such a system would depend upon whether we were willing to impose an indefinite burden on future generations to maintain monitoring and surveillance. The deep geologic repository, by contrast, will be designed so that this requirement will not be imposed on future generations.

Financing of High-Level Waste Disposal

Q.1) What activities under the Federal program--past, present, and future--for development of facilities for permanent disposal of high-level radioactive waste should be paid for by users of the repository? What, if any, of these activities should be paid for by Federal funds and not offset by repository user fees?

A.1) Estimates have been made of the fees which would need to be charged for the disposal of spent fuel. These estimates encompass all past, present, and estimated future expenditures by the Department, including not only the costs directly associated with the construction and operation of each repository but also the generic, non-site specific research and development work which the Department has done and will continue to do.

It is also possible that the fees assessed to the users of the repository include only the site specific costs associated with the construction, operation, and decontamination of the repository. The generic research and development activities could be paid for by Federal funds as is the case for other generic energy technology work performed by the Federal Government. Further analysis of this approach is being considered by the Department.

Q.2) When should the Federal Government begin assessing and collecting fees from generators of high-level radioactive wastes for Federal provision of permanent disposal facilities?

A.2) It would be desirable for the utilities and the Department to sign contracts for disposal services as soon as legislative authority to enter into such agreements is obtained. This type of contractual arrangement would enable utilities to begin collection of appropriate future disposal costs from current ratepayers. The utilities could collect fees based upon periodic Department projections for full-cost-recovery of disposal services, however, the actual fee to be paid by utilities to the Department would not be set until the Department was in a position to commit to waste disposal services and a system of payment to the Government was instituted.

Q.3) What is the optimum method of collecting fees from users of high-level waste repositories?

A.3) The Department believes that it is too early to establish a preferred methodology for collection of fees from users of high-level waste repositories. DOE has had a great deal of experience in collecting fees for uranium enrichment and we project that a similar methodology would be used for waste disposal fee collection.

Defense-sector Facilities for High Level Waste Disposal

Q.1) Should facilities for permanent disposal of high level wastes which are constructed for disposal of wastes generated by Federal defense activities be subjected to regulatory or other requirements which are different from those to which facilities for permanent disposal of similar wastes generated by civilian activites are subjected?

A.1) Yes. For National security reasons, we believe that none of the activities of the Defense Programs should be subjected to control by an independent regulatory agency.

While the Department considers that defense wastes could be disposed of in a licensed repository for commercial wastes, we believe that any separate repository specifically for defense high-level wastes should not be licensed by NRC. Should this later option be chosen by the Administration and Congress, an Amendment to the Energy Reorganization Act of 1974 exempting such facilities from NRC licensing would be required.

Mrs. BOUQUARD. Thank you very much.

Mr. Cotton, we apologize for the delay and ask you to resume your testimony at this time.

Dr. COTTON. The acid test of the policy whose key elements I outlined—or of any policy—is its acceptability to all the concerned parties. If it is unacceptable in whole or in part to any of the affected parties, so that any party is left with a strong incentive to thwart or to try to change it, then it may well suffer the same fate as past policies which, because they tended to favor one point of view or another, were swiftly and unceremoniously dumped as soon as people came to power who favored a different point of view.

The policy I have outlined assumes that the past failures of the waste management program stem in large part from the severe institutional and financial constraints that—despite the best efforts of many able and hard-working people—have continually hampered its operations. The history of the Federal waste management effort strongly suggests that, under the current institutional structure and financial arrangements, the Federal Government cannot make a credible commitment toward the steady development—under many administrations and Congresses to come—of a complex technological system by a specific date some 15 or more years away.

The policy I have described assumes that a long-term assurance of resources, both of manpower and of funds, and an independent or at least a stable—institution is essential to sustaining the expanded and relatively expensive program which will be necessary to meet a firm schedule over a long period of time.

The technical and institutional elements of this policy are not only mutually supportive, we believe they are inseparable. Unless it is carried out by an independent institution that does not have to spend most of one year worrying about funds for the next, or about whether it's going to exist the next year, or what form it's going to take—unless it is carried out by an independent institution with assured and adequate funding, no comprehensive program that aims to follow a firm schedule over a long period of time is likely to have much credibility with the general public or with the utilities.

An independent institution with independent funding does seem the surest—perhaps the only—way to guarantee that a comprehensive waste management program will be carried out from start to finish and on schedule. But such an institution raises a crucial and difficult question: how to insure the congressional oversight and public accountability that a democratic society must demand of such an institution? We do have some suggestions about how to balance independence and accountability. Our analysis suggests that it may be possible to gain support for creation of an independent institution with independent funding, if there is substantial agreement in advance about precisely what it is going to do and how it is going to do it. This is the reason for inclusion of explicit legislated goals and a congressionally approved detailed management action program among the basic elements of a comprehensive waste management policy. We will discuss these at greater length in the testimony that we submit for the record.

In summary, our overarching finding, based on a careful review of the history, is that comprehensive action by the Congress will be needed to get out of the nuclear waste stalemate. The history of nuclear waste policy is littered with attempts at partial solutions by policymakers who tried their best to use the limited levers under their direct control to break the logjam. The clear evidence is that not only do these efforts fail to work, but they often make matters worse by further lowering the credibility of the Federal waste management effort. The nuclear waste management problem appears to be a nettle that, painful as that may be, must be grasped in its entirety if it is ever to be finally resolved.

These, Madam Chairman, are in briefest details the key elements of and the reasons for a waste management approach that is designed to avoid the mistakes of the past and to gain the confidence of the technical community and the general public that the Federal Government can and will safely manage and dispose of high-level nuclear waste.

The legislation that you are considering today does embody many features that OTA's analysis suggests are vital to a successful waste management effort. Our more detailed comments on the legislation are contained in the remainder of my written testimony.

I would be glad now to answer any questions you may have on my presentation or on our views on the key elements of the legislation.

[The prepared statement of Dr. Cotton follows:]

TESTIMONY OF THOMAS A. COTTON

OFFICE OF TECHNOLOGY ASSESSMENT

BEFORE THE
SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY
ON
THE HIGH-LEVEL RADIOACTIVE WASTE
MANAGEMENT AND POLICY ACT
AND
H.R. 1993: THE RADIOACTIVE WASTE
RESEARCH, DEVELOPMENT, AND POLICY ACT

OCTOBER 5, 1981

Madam Chairman, my name is Thomas Cotton and I am the project director of a study the Office of Technology Assessment is conducting of commercial high level radioactive waste management in the United States. I have been asked to present OTA's "comments and perspectives on the key elements of a waste disposal program" as well as OTA's views "on the desirability of, and any recommended changes to, the proposed legislation." Let me briefly describe some of the main conclusions that have emerged from OTA's study thus far.

For the sake of brevity, I will limit my oral remarks today to our view of the basic elements of a comprehensive radioactive waste management policy. Our comments on the key provisions of the legislation that you are considering are contained in my written testimony; I would, of course, be glad to answer any questions on those comments that you might have. We would also like to submit for the record a more detailed section-by-section analysis of the legislation within several weeks.

The evidence is clear that not until about the mid-70's did the Federal government begin to devote substantial attention or resources to the problem of nuclear waste management. The waste management effort has, in general, been characterized by a number of fundamental ills, including: sharp and sudden shifts in policy; the low priority placed upon the program at the agency and departmental level; inadequate resources (both in money and people) from year to year; general institutional instability; and the failure to adequately address the concerns of states and others. As a result, there is today a widespread lack of confidence that the Federal government can or will manage high level radioactive waste safely and efficiently and at a rate and scale commensurate with projected levels of nuclear power generation. The deepest and most consuming doubts concern not so much the technology for disposal -- the disagreement there centers on the feasible rate of technology development rather than on the choice of technology -- but rather the institutional capacity of the Federal government to carry out, over a period of twenty years or more, the difficult and sustained effort required to both build and operate a disposal system capable of handling large amounts of high level radioactive waste.

In addition to these public doubts concerning the waste disposal effort as a whole, the utilities with nuclear reactors face two critical uncertainties: 1) as spent fuel continues to pile up, reactors are running out of storage space, and may have to shut down unless more storage space is made available on a timely basis; and 2) utilities face an open-ended responsibility for growing inventories of spent fuel with no idea when or how or at what cost that fuel will finally be disposed of.

To resolve both the public and the utilities' uncertainties about how, when and whether high level radioactive waste can and will be finally and safely disposed of is the goal that a successful waste management program must be designed to meet. The greatest single obstacle to such a program is the severe erosion of public confidence in the Federal waste management effort.

In citing the past flaws and failures of the waste management program, we do not mean to suggest that no significant progress has been made or that any burden of blame must fall upon the shoulders of the many dedicated and competent people who have carried out that program. The problem has not been the quality of the people involved, but rather the tasks they have been called upon to perform with what, until recently, were meager resources and very difficult circumstances. Indeed, it has been the hard work of the staff and laboratories at the Department of Energy, the Nuclear Regulatory Commission, the Environmental Protection Agency, the U.S. Geological Survey, and other agencies that has laid the firm groundwork for the commitment contained in the legislation that this committee is considering. Many of the necessary analytical tools and data that were only under development at the time OTA undertook its study are now ready to be applied to the task of developing a management action program.

When OTA began its study, we were encouraged by this committee and by OTA's Congressional Board to take a comprehensive view of the waste management problem and to identify, if possible, the sequence of decisions and actions which could lead to the development of an operational high level radioactive waste management system. During the three years we have devoted to the subject, we have sought and analyzed a wide range of views — from the technical community, program personnel in the involved Federal agencies, the nuclear industry, the environmental community, state and local officials, and the lay public. As a result of that effort, and of the technical and institutional studies performed during the course of the assessment, we have identified what we believe to be the basic elements of an integrated commercial high level radioactive waste management policy that would be responsive to the key concerns of the affected parties. None of the individual elements of that policy are new. They have all been considered at one time or another. Some have been incorporated into bills introduced in Congress. Some have been, or are now, part of Administration policy. We believe, however, that the policy we will discuss forms a cohesive set of interdependent and mutually supportive elements which, taken together, could form the basis for the broad and stable consensus needed to break the current stalemate and get on with the job of radioactive waste management.

Other policies could conceivably achieve the same ends. However, we have concluded from our analysis that the integrated policy that we will outline is, in its main elements, capable of securing the credibility, stability, and broad support that are the essential ingredients for a successful radioactive waste management policy.

The elements of the policy we will describe have been selected on the basis of a single, simple principle: in waste management perhaps even more than in other matters, Murphy's Law is likely to reign supreme — if anything has gone wrong in the waste management program in the past, it is likely to do so again unless specific measures are adopted to prevent it. And the public tolerance for further mistakes has worn extremely thin. The cost of future failure will be extremely high.

OTA has concluded that an integrated, comprehensive commercial high level radioactive waste management program would contain six key elements:

1. A firm commitment in law to develop a regional system of mined geologic repositories on a realistic schedule; to accept waste from utilities beginning on a specified date by which the first repository is intended to be available; and to accept, in the meantime, limited amounts of spent fuel from those utilities that are unable for technical reasons to provide their own interim storage capacity.

This commitment by the Federal Government to have a permanent disposal system ready to begin receiving waste on a specific day in a specific year, is, in our opinion, the linchpin of the policy. Without such an unambiguous national commitment, there is simply no compelling reason to get the job done. The remaining five elements are those that we believe are necessary to make such commitment both feasible and credible.

2. Rapid development by the Administration, and approval by Congress, of a credible and binding management action program that spells out the technical and institutional actions and milestones that must be accomplished, the contingencies that must be planned for, and the financial and managerial resources that will be needed to deliver on those commitments.

3. Creation of an institutional mechanism to ensure that the financial and managerial resources needed to carry out the management action program will be available over the long time period required to fulfill the commitment, independent of competing short-term priorities of the Federal government. One possible model would be an independent, self-financing public corporation funded by direct user charges -- such as the Tennessee Valley Authority.

4. Establishment of an oversight process which can assure the Congress, the directly affected parties, and the American public that the responsible agency will be held accountable for the safe, efficient, and timely implementation of the management action program -- while at the same time providing the independence from the uncertainties of the annual Federal budget process that the agency will need to carry out its mission. Congressional approval of a detailed management action program, to be implemented by an independent agency subject to annual oversight rather than to annual budget control, could play an important role in balancing independence and accountability.

5. Development of a regulatory process that makes ample allowance for the first-of-a-kind nature of high level radioactive waste disposal

technology.

6. Explicit provision in law of those measures -- such as a formal role in repository siting decisions, and perhaps impact compensation -- that are needed to deal adequately with the basic concerns of the states that will be affected by the Federal waste management activities.

The acid test of the policy whose key elements I have just outlined -- or of any policy -- is its acceptability to all concerned parties. If it is unacceptable in whole or in part to any of the affected parties, so that any party is left with a strong incentive to thwart or try to change it -- then it may well suffer the same fate as past policies which, because they tended to favor one point of view or another, were swiftly and unceremoniously dumped as soon as people came to power who favored a different point of view.

The policy I have outlined assumes that the past failures of the waste management program stem, in large part, from the severe institutional and financial constraints that -- despite the best efforts of many able and hardworking people -- have continually hampered its operations. The history of the Federal waste management effort strongly suggests that, under the current institutional structure and financial arrangements, the Federal government cannot make a credible commitment toward the steady development -- under many different Administrations and Congresses to come -- of a complex technological system by a specific date some fifteen or more years away. The policy I have described assumes that a long-term assurance of resources, both of manpower and of funds, and an independent -- or at least a stable -- institution is essential to sustaining the expanded and relatively expensive program which will be necessary to meet a firm schedule over a long period of time.

The technical and institutional elements of this policy are not only mutually supportive -- they are inseparable. Unless it is carried out by an independent institution that does not have to spend most of one year worrying about funds for the next, or about whether it's going to exist next year or what form it's going to take -- unless it is carried out by an independent institution with assured and adequate funding, no comprehensive program that aims to follow a firm schedule over a long period of time is likely to have much credibility with the general public or with the utilities.

An independent institution with independent funding does seem the surest -- perhaps the only -- way to guarantee that a comprehensive waste management program will be carried out from start to finish and on schedule. But such an institution raises a crucial and difficult question: how to ensure the Congressional oversight and public accountability that a democratic society must demand of such an institution? We do have some suggestions about how to balance independence and accountability. Our analysis suggests that it may be possible to gain broad support for creation of an independent institution with independent funding if there is substantial agreement in advance about precisely what it is going to do and how it is going to do it. This is the reason for inclusion of explicit legislated goals and a Congressionally approved detailed management action program among the basic elements of a comprehensive waste management policy. We will discuss these at greater length later in our testimony.

In summary, our overarching finding, based on a careful review of the history, is that comprehensive action by the Congress will be needed to get out of the nuclear waste stalemate. The history of nuclear waste policy is littered with attempts at partial solutions by policy makers who tried their best to use the limited levers under their direct control to break the logjam. The clear evidence is that, not only do these efforts fail to work, but they often make matters worse by further lowering the credibility of the Federal waste management effort. The nuclear waste management problem appears to be a nettle that, painful as that may be, must be grasped in its entirety if it is ever to be finally resolved.

These, Madam Chairman, are -- in briefest detail -- the key elements of, and reasons for, a waste management approach that is designed to avoid the mistakes of the past and to gain the confidence of the technical community and the general public that the Federal government can and will safely manage and dispose of high level nuclear waste.

I would now like to discuss some of the features of the legislation you are considering, in the framework of these key elements.

1. Commitment to explicit goals.

The legislation you are considering today does embody many features that OTA's analysis suggests are vital to a successful waste management effort. It would represent a large step towards resolving public concerns about whether the Federal government has the waste disposal problem in hand by making a firm commitment to the development of the most well-defined and extensively studied disposal concept -- mined geologic repositories. The OTA study concludes that such a commitment is consistent with the current state of knowledge, since the concept of geologic disposal has survived many intensive reviews without the identification of any insurmountable scientific or technical barriers to its successful implementation. Of course, many technical questions remain to be resolved, and design decisions to be made, before it can be implemented with confidence at an actual site. This bill rightly focuses attention on the many technical and institutional hurdles that must be passed before we can have a licensed, operating repository, and the importance of getting on with the job now.

This commitment to development of geologic repositories should also increase the confidence of nuclear utilities that an ultimate solution to their growing spent fuel problem is on the way. Nonetheless, it still leaves them with some uncertainty in planning for the interim spent fuel storage that they are expected to provide, since the bill makes no explicit commitment to a schedule for the Federal government to begin to accept spent fuel.

If a commitment were made to a credible schedule for beginning to accept waste at a final repository, it should considerably aid utility efforts to provide their own interim storage in the meantime, since it would remove a principal source of resistance to interim storage -- the concern that it would encourage indefinite deferral of a disposal system.

It is important to recognize that the commitment in this bill to a schedule for the technical and regulatory steps involved in taking a first candidate respository site through the licensing process will not necessarily assure that an operating repository will in fact be available at the end of the process. There is a very real possibility that the relevant agencies could meet every deadline specified in this bill, and still wind up at the end of the licensing process with a rejection from the NRC and no operating repository. There is, at this time, no technical consensus about how likely it is that any particular site that appears suitable for licensing at the end of site characterization will, in fact, survive the entire licensing process. For example, some experts believe that we can be certain of the ultimate licenseability of a site at the time an application for a construction permit is made; others believe that a considerable chance of rejection could remain at that point. Thus, the schedule in this bill for NRC decisions on the first repository site is not necessarily tantamount to a schedule for approval of a construction permit, and later, an operating license -- at least, not if the less optimistic view proves to be correct. While another site could be submitted if the first were rejected, that could mean a significant slippage in the repository availability date, which the public might well perceive as a major failure in the waste management program. Our analysis of the history of waste management suggests that the remaining margin of confidence could be seriously depleted by such an event.

The most straightforward way to reduce the risk of licensing rejection is to provide the time and resources necessary to carry more or less simultaneously, more sites through the site characterization process and into the licensing process, which would ensure that backups are immediately available if the first site considered proves to be unlicenseable. This potentially redundant approach might substantially increase the initial costs of developing the repository system. For example, the U.S, Geological Survey has estimated that it would cost about $1.8 billion through 1995 to characterize 26 sites, across the nation, adequately for submission of a license application. It would cost another $1 to $1.5 billion to carry a single additional site from that point through to an operating license. However, it appears certain that more than one site will eventually be needed anyway, so the effect on total waste management costs in the long run may be less significant.

If Congress wished to commit to a schedule for accepting spent fuel from utilities wishing to dispose of it, and to ensure that a repository would be available by a firm date, it may be prudent to select a conservative date to begin receiving waste, one that would allow for multiple site evaluations and for slippages in the licensing process. This could minimize the chance that an expensive independent storage facility may have to be constructed in order to deliver on the commitment if a repository is not available on schedule. Although we would defer to the judgments of DOE, USGS, and NRC in this regard, it appears to us that the schedule included in this bill is very optimistic, and leaves little or no margin for error or surprises of the sort that have plagued the waste management program in the past. Because of the low reservoir of goodwill and confidence that the Federal government still enjoys in this area, there may be serious consequences if a major milestone is missed, or the legislated schedule has to be relaxed, because it proves to have been overoptimistic. This could be particularly serious in the case of the earliest deadlines, which -- if missed or relaxed -- could very quickly undermine the credibility of the entire schedule at precisely the time when it is most important to rebuild confidence in the Federal waste management program. In contrast, a more conservative target date can always be tightened later if it proves feasible to do so, with no loss in public confidence.

Adoption of a conservative date to begin accepting spent fuel would not preclude an earlier target date for the first repository; in fact, a conservative program would probably require an earlier target date, with an adequate allowance for unforeseen slippages. While a detailed analysis by DOE would be needed to provide a firm estimate of a safe date for a commitment to accept spent fuel at a repository site, our analysis and discussions with experts in the field suggest that some time in the 1995-2000 time frame would be feasible -- provided that resources are available for an expanded site evaluation and licensing process.

A final question concerning the overall goals of comprehensive legislation relates to the question of whether or not you wish to have a regional disposal system -- with near-simultaneous development and operation of several repositories geographically distributed so as to minimize the costs and impacts of waste transportation -- as opposed to a centralized system in which one repository at a time is developed and operated until it is full. From the point of view of safety, there are at present no strong arguments favoring either approach, since at least several repositories will probably ultimately be needed just for the reactors that are now operating or under construction, and there is no a priori reason to believe that licenseable sites cannot be found nearer to the bulk of nuclear power generation than most of the sites that are under consideration now. The OTA analysis suggests that there are several potential advantages of a regional approach which could make it more broadly acceptable than a centralized one:

First, it would be more equitable, both because repositories would be located nearer to the source of waste generation, and because fewer communities would be affected by transportation. Analysis performed by Oak Ridge National Laboratories for the National Academy of Sciences clearly shows that many states in the Midwest and West, which would be practically unaffected by waste transportation in a regional repository system, would become major transportation corridors in a centralized one, since it appears fairly likely that the first repository will be in the West (See figures 1 and 2).

Second, a regional system, with several repositories operating simultaneously, could be less vulnerable to the effects of accidents or other interruptions than would a centralized system. Similarly, setting as the goal of the repository development and licensing program the development of two sites, rather than one, could reduce the potential political costs of delays or problems that are associated with the all-the-eggs-in-one-basket focus on a single site of a centralized system.

Finally, a regional system could substantially reduce transportation costs. The Oak Ridge study just cited showed that a centralized system with a single repository in the West could add nearly one billion dollars in transportation costs by the year 2004 compared to a regional system that included several sites east of the Mississippi (See Tables 1 and 2). Of course, the transportation cost savings of a regional system would be offset to some extent by the additional front end costs required to locate and develop one or more suitable sites in the East, although at the present time no integrated analysis is available to show which approach is more cost-effective in the long term when all costs and benefits (such as system reliability) are taken into account. However, it is clear that the initial costs of developing a regional system would be higher, which can be expected to lead to strong budgetary and bureaucratic pressures to continue to expand the first repository that is licensed, and to defer the capital costs of developing a second one until the first has been filled. Even if the Federal government is responsible for waste transportation, so that it has to take into account transportation costs as well, short-term budgetary decisions would be dominated by the high additional capital costs of building a second repository, rather than by the relatively small annual savings in transportation that would result some years later. For this reason, if the Congress wishes to guarantee that a regional system will be developed, it may need to commit in law to having a second, regionally sited, repository available within some short fixed interval -- say five years -- after the first is operational. In this way, the necessary actions to develop a second repository on schedule would be factored into the management action program, and the additional costs included in the disposal fee, so that the extra resources will be available as needed.

If the Congress does not wish to make this commitment until a more thorough comparison of the costs and benefits of regional and centralized systems is available, it could require the Administration to prepare such a comparison as a basis for a final decision within several years. If preparation of a management action program for Congressional approval is required, as discussed below, it could contain such a comparison and an analysis of the additional efforts that would be involved to develop a regional system; and a Congressional choice could be made in the process of approving the management action program.

2. Management action program.

a. Importance

A major contributor to the credibility of any commitment to a schedule for accepting spent fuel or waste at a repository site would be the rapid development in the next several years of a management action program that would integrate the policies and programs for interim storage, repository RD&D, and commercial repository system construction and operation. In order to ensure that the goals and milestones of the waste management program are achievable and that the resource needs are reasonably estimated, the management action program would need to identify the major potential sources of technical and institutional failure, provide measures that minimize the likelihood that these failures will occur, and include contingency plans for dealing with those failures that do occur. In contrast to this approach, the Federal waste disposal plans prepared to date appear to assume that every milestone identified in the nominal schedules will be achieved successfully without any unforeseen obstacles or failures. Yet such obstacles and failures have occurred time and again in the waste program and have led to so many slippages in schedules that any long term schedule is now highly suspect.

The provision in HR 1993 for development of a mission plan and those in the Chairman's proposed bill for a Project Decision Schedule and for a Program Management Plan for the Test and Evaluation Facility address this concern in differing degrees; we will provide more extensive comments on those provisions in our expanded submission.

Development of such a management action program may be one of the most important things that could be done in the near term to increase public confidence in the Federal waste management program. It could also allow the waste management legislation to be somewhat simplified and streamlined by focusing on the ultimate objective — for example, to have at least one licensed repository operational in time to implement a commitment to accept spent fuel from utilities on a fixed date — and leaving to the waste management agency the detailed identification of the programmatic steps and milestones needed to achieve that objective. If this management action program were then approved by Congress, it could be just as effective in directing the waste management program as would incorporation of a detailed schedule of intermediate steps in legislation, and would place the full responsibility for the feasibility of the schedule on the implementing agency. It could also avoid the potential loss of time and credibility that could result if early legislated milestones proved to be infeasible and had to be changed.

b. Role of Test and Evaluation facilities

A particularly important part of a management action program would be an integrated research and development plan that would clearly identify the remaining technical questions which need to be answered to ensure availability of a geologic repository by the desired target date, and which would lay out a detailed schedule of the activities needed to address these questions. Specifically, this plan would include a description of the research and development activities that will be conducted at demonstration or test and evaluation facilities to resolve specified technical uncertainties, and the role of such facilities in the overall development process.

It appears possible, if not likely, that a research and development plan capable of creating high confidence that a licensed geologic repository could begin full scale operations on a specified date would require a more accelerated and extensive program than that contemplated in the Test and Evaluation facility provisions of this bill. If the Department of Energy did no more than meet the schedule that has been proposed, and conducted the described activities only at the single site that is expected to be a repository, the data obtained might come too late to be of much value in the licensing process or in the design of the repository, since the facility is not scheduled to begin operations until a year after the licensing process begins and a year before repository construction is initiated.

Broadly speaking, there are two classes of scientific and engineering data that can be obtained from the sort of test and evaluation facility provided for in this bill: those related to the projected ability of the repository system to provide long term waste isolation, and those related to the logistical problems of handling and emplacing waste at high operational rates. To the extent that a test and evaluation facility is intended to provide data about repository performance that would help in the licensing process, it may be useful to obtain the same data during the site characterization process in all of the sites being characterized, rather than only after site characterization and only from the one site selected for the first license application. This would facilitate selection of the site that had the best chance of being licensed, and would reduce the delays that could result if the first choice site were rejected for any reason, by providing more and earlier data on backup sites. In addition, it could greatly reduce the concerns that conducting extensive test and evaluation activities at only one site might prejudice the site selection and licensing process. Of course, conducting such activities related to repository performance at all sites being characterized would be more expensive that the proposed program. However, the increased cost should not result in more than a marginal increase in the full cost recovery fee to the utilities, and — to the extent that the fees are collected in advance of the expenditures — financial resources should not be a significant constraint on the scope of the technical program.

The recent focus on the role of a test and evaluation facility in providing data on the ability to accept, package, and emplace waste at operational rates has been very useful, since the sheer logistic questions involved in operating a waste disposal system at commercial scale had not been given much recognition earlier. For example, simply to load a repository fast enough to keep up with the rate of spent fuel generation in the year 2000 it would be necessary to package, lower into the repository, and emplace about one canister every hour, twenty-four hours a day, 365 days a year. While there is no technical reason to believe that a system cannot be designed to do this, we have no experience at handling radioactive materials at more than perhaps one percent of that rate, so that it is almost imperative to obtain some hands-on experience at a pilot scale before attempting to design and construct a full-scale facility. It would be awkward at best to build a repository and discover that in practice it can only be loaded at half the design rate -- after it is too late to change it.

One function of the proposed Test and Evaluation facility is to provide such experience. However, according to the schedule in the bill, the facility would not begin operation until after an application for a construction permit had been submitted, at which time a design would already have to have been developed, and at most one year of data would be available by the time construction began. If the tests revealed significant inadequacies in the design that required substantial revisions, it could lead to significant delays and cost overruns that could perhaps be avoided if the data were available before a design were submitted for licensing.

The reason for the delay in the availability of this logistics data is the requirement that the Test and Evaluation facility be constructed at candidate repository site, preferably the one that is to be submitted for the first license. A principal reason given for this requirement is that it would avoid the higher program costs that would result from the duplication of construction activities involved in performing these tests at another site not intended to become a repository. However, these additional costs should be balanced against the likelihood that the necessary data could be obtained years earlier -- in time to contribute to the repository design in the first license application -- if a suitable test site could be selected quickly and facility design and construction initiated soon, rather than waiting until three candidate repository sites had been partially characterized. It appears unlikely that this could be done easily unless a site other than a potential repository site were chosen, because of concerns that early selection of such a site for test purposes could prejudice the later site selection and licensing process.

While it is clear that the most valuable data concerning potential repository performance needs to be gathered at candidate sites themselves, no evidence has yet been presented to show that logistical data concerning waste handling and emplacement is highly site specific, and that it could not be obtained equally well from a test and evaluation facility constructed at a site intended only for that purpose. (Some data concerning the ability to drill the holes in the repository floor to accept the waste canisters, will depend upon the specific medium -- salt, granite, etc. -- for the repository, but not the specific site; and in any case there are waste package designs under development that may allow the packages simply to be stacked in the repository rooms rather than emplaced in the holes in the floor.) Thus it is not clear that the benefits of conducting these tests at a candidate repository site would offset the delays that would result if it is necessary to wait until candidate sites have been identified and characterized to the point that the one having the best chance of being licensed can be clearly determined.

Concerns that early unlicensed activities involving emplacement of waste at depth in a test site could short circuit the regulatory process and lead to pressures for expansion of the site into a repository, even if it had not originally been selected for that purpose, could be reduced by selecting a site which is clearly not suitable for a repository. This should be possible as soon as site selection criteria have been developed, since they should also specify those factors which would lead to exclusion of a site from consideration as a repository. Since proximity to national defense activities may constitute one such exclusion criterion, it is possible that the Climax facility at the Nevada Test Site would be appropriate for this purpose. A logistics test and evaluation facility could probably be developed there within four to five years, since the Department of Energy is already conducting tests with spent fuel there using existing facilities for packaging spent fuel and emplacing it in a near-surface gallery mined in the Climax granite formation, as well as in drywell storage on the surface. The major additional work required would be construction of a test facility at repository depth, and modification of the existing packaging facility, or construction of a new one, to enable a test of spent fuel receipt and packaging at expected operational rates.

Such a test facility at the Nevada Test Site or elsewhere could be designed to integrate logistics tests for both geologic repositories and monitored, retrievable surface storage. Developing the packaging and handling technology that would allow the packaged waste to be emplaced either in surface storage or in a repository could help ensure that waste could be accepted at operational rates at a repository site on the target date even if there were delays in full-scale loading of the repository — either for technical reasons or because an extended period of surface cooling prior to emplacement proved to be desirable. An integrated storage and disposal test and evaluation facility would also allow development and demonstration of the capacity to remove waste from a repository at a rate comparable to the emplacement rate -- a proposed NRC requirement -- and to place it into temporary surface storage if that should prove necessary for any reason. This should help build confidence that initial emplacement of waste into a repository is not an irreversible step.

Since substantial quantiites of spent fuel would be needed for pilot scale hot tests -- perhaps 1000 to 2000 metric tons if both surface and underground emplacement are tested -- such a facility could also be used to provide the limited amount of interim Federal storage capacity that would be needed to deliver on a commitment that no reactor would have to shut down because of technical inability of the utility to provide its own interim storage on time.

Because it appears clear that it would be valuable to have logistics experience before developing a final repository design for a license application, it is probably not necessary, and perhaps not possible, to wait for development of a detailed management action program before proceeding with an integrated storage and disposal logistics test and evaluation facility, if it is to be started quickly at a site not intended for development into a repository. (In fact, it does not appear desirable or necessary to defer any elements of the ongoing DOE repository development activities pending development of such a program, since there is little time to be lost if a firm target date -- even a conservative one -- is to be met.) The function of an integrated management action program is to identify those additional activities that would be required to meet the goal, and to show how all necessary technical and institutional actions will be coordinated to ensure that the program can and will be accomplished on time. It can thus be developed concurrently with ongoing activities.

Because such a test facility could require substantial additional early expenditures above those currently contemplated in DOE's waste management program, it may be desirable to explicitly authorize its construction to help ensure that the necessary funds are made available on time.

3. Adequate and independent resources.

a. Funding

Even with a feasible goal and a credible implementation plan and schedule, the credibility of a Federal commitment to a long-term waste management program will depend upon the degree of confidence that adequate funds will in fact be provided as needed over a period of decades to carry out that plan. We conclude in our study that the question of annual funding over the long-term is central to the resolution of the waste management problem. (Our thinking in this area was greatly helped by the cooperation of the Congressional Budget Office, which prepared a staff paper on the subject for us; I offer a copy of that paper in our submission for the record.) By proposing that the program be financed directly by disposal fees paid by utilities, this legislation takes a major step towards removing funding as a constraint on the feasible technical program. Detailed comments about the proposed fee collection mechanism will be included in our extended submission. I would like to focus these remarks on one central point -- the fact that the predictability of the program depends upon the predictability of the annual expenditures from the waste management fund, not simply the predictability of the revenues going into that fund. By retaining a degree of Congressional control over annual program expenditures, these bills leave open the possibility that, in a period of pressures to balance an increasingly tight Federal budget, some of the expenditures required to assure steady progress on the waste management schedule might be deferred or eliminated — thereby jeopardizing the long term goal. In short, it appears to us that there is an inherent conflict between a stable commitment to a long term fixed schedule for a complex technical project such as waste disposal on the one hand, and a high degree of external annual budgetary control on the other.

As emphasized earlier, striking a balance between the independence that appears to be needed to ensure steady and predictable progress towards timely achievement of a long-term goal, and the degree of oversight and control required in a democratic society, may be one of the most difficult challenges involved in devising a comprehensive waste management program. Congressional commitment to explicit goals for waste management, and subsequent approval of a detailed management action plan, could provide a substantial degree of Congressional control over the program while at the same time allowing the management agency full discretion over annual expenditures from the revenues generated by the fees.

b. Management.

Availability of adequate management resources is as important as availability of adequate funds. Historically, the nuclear waste management program of the Federal government has had to compete for money, manpower, and policy-level attention with other areas of nuclear research and development that were seen as more pressing and, often, more interesting. While there have been improvements in the last 4-5 years, it is not clear that in this period of sharp cutback in Federal employment, we can be confident that over the long run sufficient management resources will be available to efficiently and effectively handle the more demanding program laid out in this bill. In this regard, I would note that recently, for reasons of management efficiency, reprocessing research was added to Deputy Assistant Secretary Meyers' other responsibilities, with the result that there is now no single policy level individual at the Department of Energy who can devote 100 percent of his attention to the waste management program.

In the long term, the problems discussed above could potentially be dealt with by creation of a public corporation as has been suggested by a number of analysts of the waste management problem. Some such structure for the waste management agency would be consistent with greater degree of discretion over its annual expenditues. It would also allow much greater flexibility in hiring and firing, and in offering both rewards for performance and penalties for non-performance. There are many possible models for such a public corporation. One is the Tennessee Valley Authority, which has direct control over the annual expenditures from the funds generated by the sales of electricity, although its budget is shown as part of the Federal budget. Congressional influence is exercised through annual oversight of its activities, direct control of TVA's debt ceiling, and appointment and confirmation of its Board of Directors.

In summary, we have concluded that the institutional arrangements for both program funding and management may set the basic limits on the credibility of any long term waste management commitment to a fixed schedule. However, alternatives to the institutional status quo -- management as a typical R&D program with annual appropriations -- have not been studied with anywhere near the degree of thoroughness as have the techical options, so that major changes at this point may be premature. In addition, it does not appear necessary to resolve those issues now in order to set in place a long term technical waste management program. At the same time, it may be important to take action now to establish a process to ensure that the institutional issues will be dealt with in a timely manner.

We would like to suggest for your consideration the option of requiring that the Administration prepare -- in addition to a management action program -- an institutional implementation plan that would present and evaluate several alternatives to the current funding and management structure. These alternatives could be reviewed by Congress at the same time as the technical plan, and a choice made in the context of a more detailed understanding of the magnitude of the management effort required to achieve the objectives established in this legislation.

In the near term, we would suggest serious consideration -- either by Congress or the Administration -- of interim measures that could stabilize the waste management organization at an appropriate policy level, insulate it from competition with other nuclear policy areas, and provide the degree of central integrated planning and management capability that will be needed to assure that a long-term Federal commitment can in fact be carried out on schedule. It may be particularly important to stabilize and insulate the waste management organization now, as insurance against the possibility of a period of institutional uncertainty and delay that could occur if the Federal energy activities are reorganized again, as has recently been proposed. This could be accomplished, for example, by establishment of the waste management organization as a separate office headed by a Presidential appointee reporting directly to the Undersecretary of DOE. This would be distinctly different from the present arrangement, in which the Deputy Assistant Secretary responsible for radioactive waste management reports to the Assistant Secretary for nuclear research and development. Long-term stability could be enhanced if the appointment were for a fixed renewable term -- say 9 years as is the case for TVA directors -- rather than for the length of an incumbent administration.

5. Regulatory process.

An independent regulatory process is seen by many as perhaps the principal means of assuring the long term safety of Federal waste disposal operations. This is in large part due to the fact that confidence that a geologic repository will adequately isolate radioactive waste over a period of tens of thousands of years will be based solely on human judgments about long term projections of performance, rather than on direct observations of that performance. Thus our confidence must ultimately rest in the independence and objectivity of those who make those judgments. For this reason, many people feel strongly that in dealing with a first-of-a-kind problem such as high level nuclear waste disposal in general, and the first geologic repository in the world in particular, it is crucial to ensure an active, independent and flexible role for the Nuclear Regulatory Commission in the repository development process.

In this regard, the proposed accelerated schedule for the initiation and completion of the licensing process may raise several risks that could offset to some extent the potential time savings. First, it may adversely affect perceptions of the integrity of the licensing process, which could weaken confidence in the waste management program and create opposition and challenges which could ultimately lead to delays. For this reason it appears unlikely that an accelerated licensing schedule will be able to achieve a broad basis of public support, since it has so far proved impossible to gain approval of an accelerated licensing process even in the case of nuclear reactors, where we already have an extensive base of experience with the technology and licensing process. Second, the accelerated licensing schedule may also increase the likelihood that the NRC decision on the first site will be unfavorable. The earlier the licensing process is initiated, and the sooner decisions must be made, the less data and analysis will be available to provide a basis for confidence that the proposed site can meet regulatory standards. Since this will be a first-of-a-kind facility and a first-of-a-kind regulatory decision, it may be prudent to allow adequate time to work out the unforeseen problems that are almost certain to occur in the licensing procedure, and to provide a very thorough basis of data and analysis before the first formal decision must be made.

For the same reasons, it also appears important to allow sufficient time to work out the regulations themselves. Of course, the desire to make final decisions about the regulations is understandable, since history clearly shows that the lack of formal safety standards has been an impediment to progress. The imminent publication of the EPA release criteria has been expected for the last three or four years, yet the draft of the proposed technical criteria has not even been published for discussion. Those responsible for developing the waste disposal system can rightly complain that it is very difficult to design a technology when one is not sure exactly what performance standards it will have to meet.

However, the situation is not quite as bad as it may seem, since the EPA proposals have been widely circulated and discussed unofficially during the last year, and the NRC's proposed technical regulations for implementing those criteria were recently officially published for comment — so that the Department of Energy knows very well the direction in which the regulations are moving, and can orient its program accordingly. For this reason, although it is very important that the proposed EPA criteria be officially published for discussion quickly, there may be less urgency about the timing of final action by EPA or NRC. In fact, there may be some disadvantages to the very tight schedule for final action proposed in the legislation. In the first place, it is not clear that it would even be possible for EPA to act as quickly as proposed -- and a failure to meet the very first deadline in the schedule would hardly increase confidence in the Federal waste management effort.

In addition, premature decisions could lead to locking in criteria and regulations that could cause problems and perhaps require revisions. That in turn could lead to delays and cost overruns if repository designs had to be changed, and perhaps to an appearance of confusion and compromised integrity of the regulatory process. For example, there are serious disagreements in the technical community about both the EPA's and NRC's proposed technical criteria. It appears unlikely that these can be readily resolved in the time frame contemplated in this bill -- if for no other reason than that both agencies may need to perform time-consuming revisions of the analysis underlying their proposals to take into account the recently revised estimates of waste toxicity.

As an alternative to the accelerated schedule in the bill, you may wish to consider the option of requiring quick publication of EPA's draft criteria for discussion, and then requiring and funding an extensive and coordinated public review of both the EPA and NRC proposals, with final publication to occur in 1.5-2 years, prior to completion of the management action program. In addition to ensuring that major problems are detected and avoided before final publication, an extensive public review could also serve to build public understanding of the reasons that many in the technical community, and in the regulatory agencies themselves, are confident that an acceptably safe geologic disposal system can in fact be constructed. It could provide an excellent opportunity for a broad public debate, and a final resolution, of the question of how safe is safe enough -- a question which is unprecedented and precedent-setting in the case of radioactive waste disposal because of the extremely long time periods for which the standards apply. A satisfactory resolution of this question would allow the efforts of all concerned to be devoted entirely to the technical question of how best to meet generally accepted standards, rather than to continued philosophical arguments about the acceptability of the standards themselves.

6. State Concerns

States have several basic concerns about Federal radioactive waste management activities:

1. The potential effects on the public health and safety of accidental releases of radioactive material from waste management facilities or from the transportation of spent fuel of high level waste;

2. Possible non-radiological, socioeconomic impacts such as the costs of having land taken off the tax rolls and increased demands on state and local services;

3. The possibility of inequities in the distribution of radioactive waste -- the fear, for example, that a state will bear more than it's fair share of the costs of dealing with what is seen as a nationwide problem.

These basic concerns of states have been exacerbated by their generally low opinion of Federal competence and responsiveness in waste management activities. In particular, states fear that considerations other than technical criteria for safety will play an unwarranted role in Federal siting decisions.

A last consequence of low Federal credibility is what may be called the "foot in the door" problem: the concern that if any waste management facility is sited -- even a small research facility -- the Federal government will seek to avoid fighting new siting battles and to save money by attempting to expand that facility's operations, eventually creating a *de facto* repository on that site. Such a sequence of events would potentially jeopardize both the safety and equity of radioactive waste siting.

State concerns may be lessened by several measures, which may be put into the management action program, negotiated between states and DOE, or legislated directly by Congress. These include:

-- provisions for monitoring and emergency response for waste shipments and facilities;

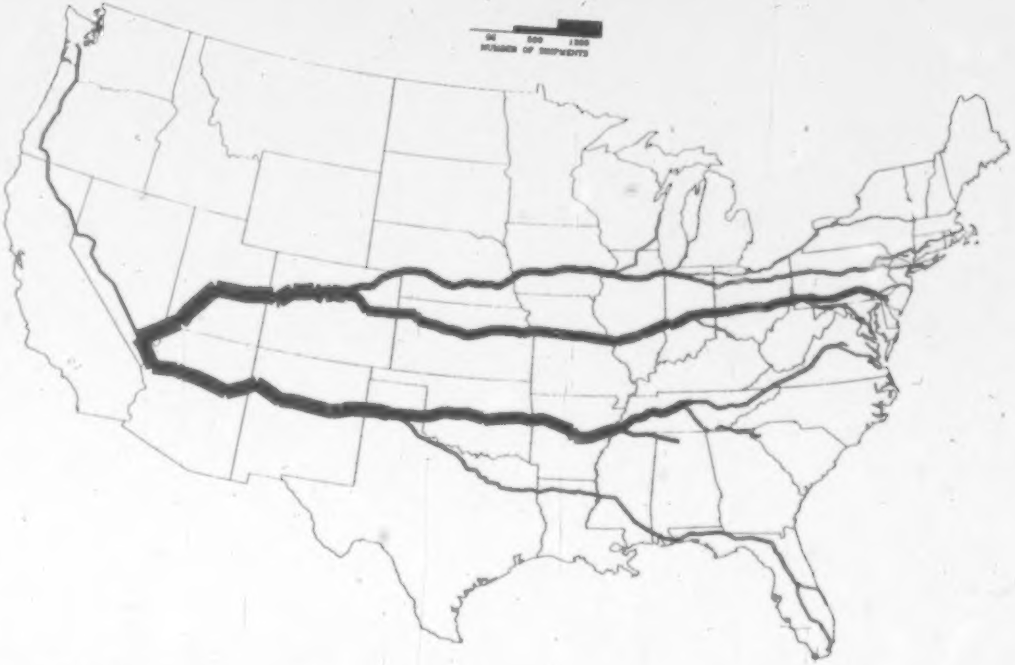
-- provisions for compensation for non-radiological impacts;

-- provisions for state involvement, including mechanisms for resolving state concerns.

Many measures directed at technical program and institutional management also bear on state concerns, such as regional siting requirements, stable and assured funding, and a stable or independent agency focused on radioactive waste management.

FIGURE 1

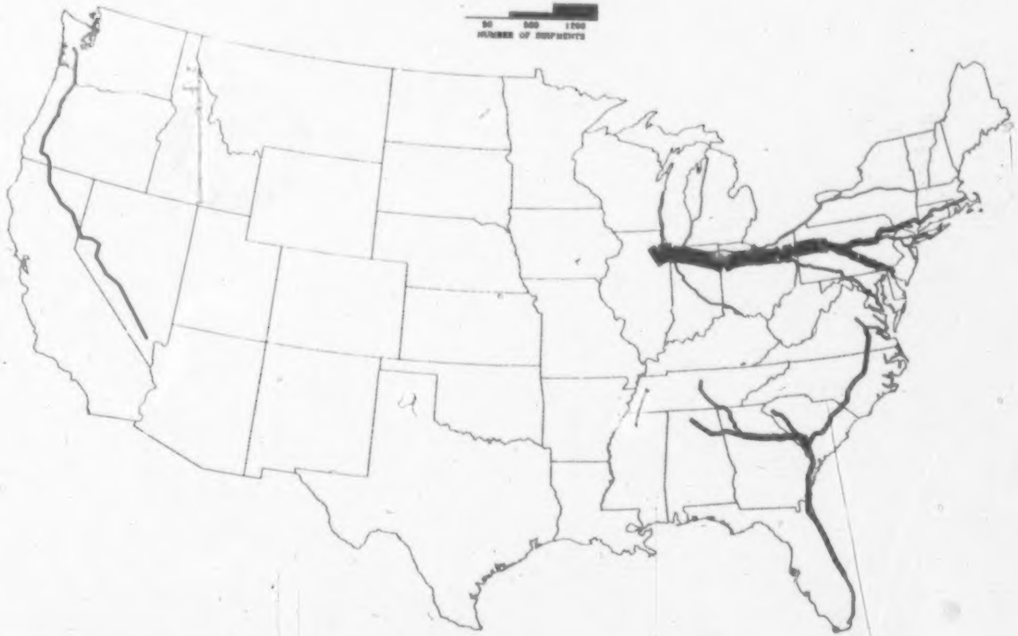
PROJECTED ANNUAL SPENT FUEL SHIPMENTS
TO A WESTERN STORAGE SITE IN 2004
BASIS: REACTORS WITH TRUCK SERVICE ONLY
(FOR DEMONSTRATION PURPOSES ONLY)



SOURCE: OAK RIDGE NATIONAL LABORATORIES,
PREPARED FOR THE NATIONAL ACADEMY OF SCIENCES
COMMITTEE ON RADIOACTIVE WASTE MANAGEMENT

FIGURE 2

PROJECTED ANNUAL SPENT FUEL SHIPMENTS TO REGIONAL STORAGE SITES IN 2004
BASIS: REACTORS WITH TRUCK SERVICE ONLY
(FOR DEMONSTRATION PURPOSES ONLY)



SOURCE: OAK RIDGE NATIONAL LABORATORIES,
PREPARED FOR THE NATIONAL ACADEMY OF SCIENCES
COMMITTEE ON RADIOACTIVE WASTE MANAGEMENT

Table 1. Transportations costs of shipping spent fuel to a single storage facility using both rail and truck modes

Year	Southeastern facility cost ($ x 10⁶)	Gulf Coast facility cost ($ x 10⁶)	Western facility cost ($ x 10⁶)
1986	2.2	3.2	7.2
1987	5.8	7.8	16.5
1988	5.4	7.6	15.0
1989	13.3	17.0	34.1
1990	14.1	16.9	30.8
1991	14.0	16.7	28.9
1992	23.6	27.3	47.9
1993	25.5	28.8	53.1
1994	28.4	29.8	54.6
1995	41.8	44.9	79.2
1996	48.4	49.7	87.8
1997	48.8	51.2	90.7
1998	61.3	63.8	109.5
1999	72.8	75.5	130.3
2000	69.7	72.4	125.6
2001	90.1	92.6	157.7
2002	91.1	92.9	156.0
2003	92.7	93.5	155.9
2004	101.7	102.9	177.4
TOTAL	850.7	894.5	1558.2

SOURCE: OAK RIDGE NATIONAL LABORATORIES,
PREPARED FOR THE NATIONAL ACADEMY OF SCIENCES
COMMITTEE ON RADIOACTIVE WASTE MANAGEMENT

Table 2 Transportation distances and costs of shipping spent fuel to regional facilities using rail and truck casks

Year	Distance (mile x 10^6) Rail	Distance (mile x 10^6) Truck	Cost ($ x 10^6)
1986	<0.01	0.15	1.8
1987	0.01	0.54	5.3
1988	0.03	0.43	5.2
1989	0.03	1.05	11.1
1990	0.05	0.93	10.8
1991	0.07	0.84	10.9
1992	0.09	1.26	16.8
1993	0.13	1.26	19.2
1994	0.15	1.01	19.5
1995	0.22	1.53	28.3
1996	0.29	1.70	33.8
1997	0.32	1.65	35.0
1998	0.36	1.98	41.9
1999	0.46	2.43	51.4
2000	0.48	2.29	50.3
2001	0.61	2.45	62.4
2002	0.60	2.72	63.0
2003	0.65	2.49	63.9
2004	0.68	2.94	70.9
TOTAL	5.24	29.65	601.5

SOURCE: OAK RIDGE NATIONAL LABORATORIES,
PREPARED FOR THE NATIONAL ACADEMY OF SCIENCES
COMMITTEE ON RADIOACTIVE WASTE MANAGEMENT

Mrs. BOUQUARD. Thank you very much, Dr. Cotton.

Do you believe that the T. & E. facility as proposed in the Bouquard/Lujan proposal is a valuable addition to the repository program?

Dr. COTTON. It's clear that the kind of data that could be obtained in the test and evaluation facility could definitely contribute to the repository program. There are two kinds of data, one related to the performance of the repository and one related to the logistic problems of accepting, handling, and placing spent fuel or waste in a repository. It may be useful to gather some of that data at other sites in addition to the potential repository site, and we have some comments in our backup document related to that.

Mrs. BOUQUARD. How do you feel? Would these, as a sort of sideline, foster public confidence as well in our commitment to the disposal of nuclear waste, that we are, indeed, progressing?

Dr. COTTON. I would think that the commitment in the bill to the development of repositories may be the most important single thing that can be done to build public confidence that the job is going to get done. We would say that probably the next most important thing would be to rapidly develop a really credible and coherent action program to show how all of the pieces will fit together over the next 10 to 15 years to deliver a repository. The question of whether specific kinds of activities, either at a repository site or elsewhere, will build public confidence is one I could not answer myself. You would have to ask the various groups who are concerned about lack of progress in the waste program.

Mrs. BOUQUARD. I'd like your comments on the proposal for fixed payments to the States in the Bouquard/Lujan proposal.

Dr. COTTON. In our study we concluded that one of the things that have been missing from proposals up to this year is any recognition that there are socioeconomic impacts on the States involved, that the repository is under any circumstances not a particularly attractive facility. It's somewhat like a warehouse and like a mining operation, neither of which is terribly attractive to a community. With the Federal Government owning it, it's even less attractive, because it's not subject to taxes. So it would appear that any provision such as impact payments or the payment provided in this bill would reduce some of the negative features that would otherwise be associated with a repository.

Mrs. BOUQUARD. Would you comment on the consultative roles for the NRC and the States and the tribes. Do you ultimately think they will be helpful in a more timely manner?

Dr. COTTON. I couldn't comment on the details of specific proposals in the bill, but it's clear to us there must be an active involvement of those groups, in order to avoid confrontations and the sorts of things that could lead to unanticipated delay.

Mrs. BOUQUARD. Do you think it's going to be helpful to have the NRC fully involved in the program from the very beginning?

Dr. COTTON. Yes.

Mrs. BOUQUARD. In what way, specifically? What specific areas do you think it would be helpful?

Dr. COTTON. One particular way that hasn't been addressed very clearly is in the process of developing what we would refer to as the "technology of proof." Mr. Meyers has alluded to the challenge that we face in demonstrating in a licensing process that a repository will behave in a certain way over a 10,000-year period. I think it's very important that work at both agencies be focused on that problem and on the formal steps that will be involved in the licensing process to demonstrate that a canister will last 1,000 years and to demonstrate that the repository will perform as expected.

This is something that needs to be thought about very carefully so that the bugs can be worked out before the first licensing process.

Mrs. **Bouquard**. Thank you very much.

Mr. Lundine.

Mr. **Lundine**. First of all, I want to thank you for what I consider to be very, very helpful analysis. I think you're living up to what the OTA is charged with doing in terms of analyzing and enlightening the Congress on the key elements of, in this case, the challenge to meet an area of public policy which, as you point out, at least until recently, has been honored by its being ignored.

There are a couple of parts to your six elements that you consider key to the radioactive waste management program that I'd like to further explore with you. First is what you call the management action program. You believe that that has a high priority because it is necessary for people to understand fairly clearly where both the administration and the Congress intend to go with the waste management program; is that correct?

Dr. **Cotton**. That is correct. We think it becomes even more important to identify all of the steps that are needed and to anticipate the problems that might arise, if you are going to make a commitment to a fairly tight schedule. A recent internal analysis at NASA—that was performed partly at the request of the Committee on Science and Technology—showed that one of the major contributors to the cost overruns and schedule overruns that they've experienced recently in some of their projects was the failure to spend adequate time at the beginning thoroughly planning for the mission before they launched into it.

Mr. **Lundine**. So in spite of the fact that they have their own problems with cost overruns, and without getting into whose buzz words we use, something in the nature of the NASA planning process is necessary, in the judgment of OTA, to come up with a nuclear waste management plan that will have credibility and be able to be implemented?

Dr. **Cotton**. We believe so.

Mr. **Lundine**. The second aspect that you recommend, which seems to me to be at the heart of it, is a self-financing public corporation. How would you envision such a corporation working, and what are the pitfalls we might watch out for in trying to create something that you would anticipate being a problem?

Dr. **Cotton**. There are really two separate questions. One is the independent funding; the other is the independent institution. We think the legislation that's been presented takes a major step forward in assuring that funds are available by providing them at the front from the utilities. We would make an observation that it's important that the expenditure of funds on the program be removed from the pressures of the annual budget process, if you wish to meet the schedule.

We find that there is an inconsistency between a high degree of annual control over the expenditures and a commitment to a firm schedule. It's hard to see how you can have both. It's perfectly appropriate to maintain a high degree of annual budget control, if you are willing to leave the end date open. But I don't think you can have both together.

The importance of an independent institution became apparent only late in the day in our own analysis, and we believe that a considerable amount of thinking needs to be done on the problem of institutional design, if one wished to create such an institution. There are some models. As I suggested, TVA is one; and there are quite a few public corporations around that could be examined. We think some time needs to be spent to design an institution that would be appropriate. The problem that we see there is that because of the loss of credibility that has occurred, people may be quite reluctant to create an institution and give it a fair amount of independence to go out and do a job without defining in advance very clearly what the job is that they're going to do. That is one additional reason that we feel development of a very clear management action program which specifies in some detail what will be done is so important. People may be willing to give more independence to an institution if it could be agreed in advance what it is going to do rather than simply giving it an open ended writ of authority.

Mr. LUNDINE. It seems to me not only the Congress but the utilities would have a very definite interest in whether or not the money that they would be paying into a fund would, in fact, be a tool to solve their problem, when that problem comes along.

Dr. COTTON. One addition function of the sort of plan that you outlined in your bill and which we've been referring to as the management action program is that it would clearly specify the expenditures that are needed over time. Therefore, it would become the basis for calculating the fee that would need to be charged to pay for the programs. Once the fee were calculated and once the plan were approved, you would have a vehicle for insuring that the money is, in fact, being spent the way that you've agreed it will be spent.

Mr. LUNDINE. I envision it as these two provisions going together. In other words, you can't really self-finance with confidence by both the utilities and the public or the Congress, unless you have a plan that is known. And while I am not at all interested in just having plans that are never implemented, it seems to me that the best way to be sure that it's going to be implemented, if you engage in a plan, is to have the financing there to do it on a predictable basis.

Dr. COTTON. Exactly. We see them as being very closely linked and mutually supportive.

Mr. LUNDINE. I just wanted to ask you about one other area. One proposal to deal with the more immediate problem of the spent fuel that is piling up at various reactor sites which I think has received too little attention has been the possibility of demonstrating a dry storage technique at the sites of the reactors.

Did your study look into this in any way? And what is your recommendation on dry storage?

Dr. COTTON. Yes, we did look at dry storage, and concluded that the technology appeared to be quite close to the demonstration stage, rather than being 10 years away. In fact, the Tennessee Valley Authority, which has one of the best spent fuel storage programs around, is planning a series of early demonstrations. So, it does seem that it is a technology that is very close to being available, and that the major problem is demonstrating that it is licensable and usable at reactors. The Department has begun focusing on that this year, and is working now with TVA and with other utilities, I believe.

Mr. LUNDINE. The Department of Energy?

Dr. COTTON. Yes.

Mr. LUNDINE. Thank you.

Mrs. BOUQUARD. Mr. Goldwater.

Mr. GOLDWATER. EPA has not issued its standards for radiation levels around the repositories. How long have they been working on this, these standards, and how important are these standards to the decisionmaking process?

Dr. COTTON. The EPA standards have been about to come out imminently for the last 3 or 4 years, and are still about to come out. It is very important to get agreement on what those standards are, since they represent the definition of how safe is safe enough for a repository. It seems to us that the most urgent thing now is for the draft standards which EPA has produced to be published. They have been stuck for some months over there. Although they haven't been formally issued, they're being circulated and talked about, so people know what they are. The Department of Energy knows what they are. But you need to begin the formal public review process so we can get a public debate on those standards, and get agreement about them.

We are a bit concerned that EPA may simply be unable to meet the schedule in the bill for early finalization of the standards. That would lead to a very early slippage in the schedule, which would not build confidence.

More importantly, it may lead to locking in too early on standards which may in fact not be exactly the way we want them to be. And there are disagreements in the technical community about the precise nature of those standards. There are some disagreements about the proposed NRC standards as well.

We believe that it would be important to start that public review process as quickly as possible, and then to take a year or 2—it may take that long—to thoroughly air the issues, to look at the NRC and EPA standards in an integrated way, in an integrated review process so that we can really put behind us the question of how safe is safe enough, and get on to the technical question of how we are going to meet those standards. It may take congressional pressure to force such an integrated review.

Mr. GOLDWATER. What kind of timeframe are you referring to when you say you may not have enough time?

Dr. COTTON. There was, I believe, a schedule of 6 months after passage of the bill for final promulgation of the EPA standards. You see, they haven't even published the draft standards.

Mr. GOLDWATER. You are maybe optimistic that maybe the Congress might get something out this year?

Dr. **COTTON**. You might be able to force the draft standards out.

Mr. **GOLDWATER**. I mean a bill out.

Dr. **COTTON**. Oh. Well, I wouldn't make a judgment on that.

Mr. **GOLDWATER**. I mean, I am excited about what Mrs. Bouquard and Mr. Lujan—and the fact that other committees are beginning to talk about it, but I have been excited before.

What value is there in keeping military wastes separate?

Dr. **COTTON**. I think one that's been cited is that because there has been substantial agreement reached about some issues as far as they relate to commercial repositories, and lack of agreement reached on the same questions as far as they relate to military repositories, separation of those issues may facilitate resolution of the civilian waste management problem and allow the process to move ahead on that side, even if all the details on the military side have not been resolved. We see no reason why the defense waste program could not purchase space in repositories that are part of a commercial waste management system.

Mr. **GOLDWATER**. Technically, there is no problem or difference.

Dr. **COTTON**. Presumably one would have to design the repositories appropriately, and you would have to know that was going to be done, so that you could specify a waste form for the defense waste that would be appropriate. But this would be similar to the situation you have now with NASA, where the civilian and military space activities are separated, but the Pentagon is buying space on the shuttle. That could be done.

If the defense waste program wanted to go ahead and build its own repository, that would be a separate issue.

Mr. **GOLDWATER**. But primarily, the value is more political than it is technical?

Dr. **COTTON**. I think you would have to make that judgment. It just appears to us that one of the major obstacles to reaching an agreement last year was the application of some principles—such as a State role in siting, for example—to military repositories, as well as commercial ones.

Mr. **GOLDWATER**. Dr. Cotton, thank you for your presentation. You're going to supplement it?

Dr. **COTTON**. Yes. We will get it to you.

Mr. **GOLDWATER**. Thank you.

Mrs. **BOUQUARD**. Mr. Volkmer?

Mr. **VOLKMER**. No questions.

Mrs. **BOUQUARD**. Dr. Cotton, we certainly thank you for your timely and very valuable testimony. One final question I have for you: Do you think the project decision schedule that we have in the Bouquard-Lujan bill is necessary, and do you think it's an important part of resolving the waste disposal problem?

Dr. **COTTON**. Yes. We feel there were really two elements in that bill—one was the project decision schedule, the other was the management plan for the T. & E. facility—which we felt could be combined into a single integrated plan that relates not simply to one particular repository site, but to the whole set of activities that will be required to develop a repository system.

We think that some sort of a clear schedule is a necessary step.

Mrs. **BOUQUARD**. Thank you very much for being with us this afternoon.

Our next witness is Dr. Linn Draper. We certainly welcome you to our subcommittee this afternoon. We are looking forward to your testimony as well. Dr. Draper, would you identify your associates.

TESTIMONY OF E. LINN DRAPER, JR., VICE PRESIDENT, GULF STATES UTILITIES CO., APPEARING ON BEHALF OF EDISON ELECTRIC INSTITUTE, UTILITY NUCLEAR WASTE MANAGEMENT GROUP AND THE AMERICAN NUCLEAR ENERGY COUNCIL, ACCOMPANIED BY R. G. SNIPES, DUKE POWER CO., AND R. R. CALABRO, NORTHEAST UTILITIES.

Dr. **Draper**. Yes, I will, Madam Chairman. I have prepared a moderately lengthy statement that has been presented to the secretary, which I would ask be placed in the record.

Mrs. **Bouquard**. Without objection, it will be made part of the record. You may proceed as you wish.

Dr. **Draper**. Thank you. My name is E. Linn Draper, Jr. I am vice president of Gulf States Utility Co., and chairman of the Utilities Nuclear Waste Management Group, and a member of the Edison Electric Institute's Nuclear Power Executive Advisory Committee. As I believe you are aware, the UNWMG is a group of 39 publicly owned and investor-owned electric utilities, which is concerned with matters related to nuclear waste management.

I am also appearing on behalf of the Edison Electric Institute, the association of the Nation's investor-owned utilities, whose members generate more than 78 percent of all the electricity in the country and serves 67 million ultimate customers in the United States; and on behalf of the American Nuclear Energy Council, which represents more than 100 organizations having interest in nuclear power, including private, public, and cooperatively owned utilities, manufacturers, architect-engineers, and various firms in the nuclear fuel cycle.

Accompanying me today are Mr. R. G. Snipes of Duke Power Co. and Mr. R. R. Calabro of Northeast Utilities. Mr. Snipes and Mr. Calabro are leaders of the UNWMG working groups for high-level waste and spent fuels storage, respectively.

As you are aware, testimony on H.R. 1909 was presented to the subcommittee last February by Mr. Snipes. At that time, Mr. Snipes discussed some of the history of the Federal nuclear waste management and details of the bill. I also testified on H.R. 1909 on June 17 of this year. Although we are discussing a different bill today, I think some of the points made in this earlier testimony are pertinent.

The Federal Government's program for managing high-level waste and spent nuclear fuel over the past 4 years has amounted basically to an effort to study a broad range of parameters related to high-level waste disposal rather than aimed at placing a waste repository into operation in a timely fashion. Literally hundreds of millions of dollars have been spent on a seemingly endless array of studies on different components and other aspects of a repository system.

Further, although the Federal program has involved the efforts of a battallion of scientists and engineers, there has been little indication in the past that an expeditious choice is to be made from among the wide variety of waste forms, canisters, geologic media, and so on; and that the establishment of geologic repositories will be actively pursued in a direct and timely fashion. Thus, while waste management's knowledge and technology have advanced, providing an ever-greater degree of confidence in the ability to dispose of high-level waste, there has been a lack of actual progress toward demonstration of the technology.

Against this backdrop, current public concern over high-level waste disposal is understandable. While it is true that no physical harm has been done, and that, from an environmental health and safety standpoint, there is no reason to be concerned with the continued interim storage of spent fuel and high-level waste from existing and future reactor operations, there is a need for field demonstration that waste disposal can be accomplished.

We believe that public concerns could be greatly alleviated by the establishment of an operating repository. What is now urgently needed to insure the early operation of the first geologic repository is a well defined Government plan of action.

This subcommittee is to be applauded for recognizing the importance of adopting a national waste management plan through comprehensive legislation and for proposing actions designed to insure its implementation as embodied in the Bouquard-Lujan discussion draft.

To insure the implementation of a national waste management strategy, a single lead agency is needed for the national program, and an effective mechanism is required to assure the necessary coordination among Federal and State agencies involved. While we believe DOE is now committed to a responsible program for waste management, legislation is still needed to assure that changes in administrations will not result in changes of direction and unnecessary delays, as in the past.

Legislation is required to define the role of the States and Indian tribes and to clarify the decision points at which compliance with the National Environmental Policy Act is appropriate, and also, where appropriate, to streamline NRC licensing procedures for repositories. Furthermore, we believe that any waste management program established by legislation must be managed by a project-oriented organization, must have adequate financial resources, must be technically conservative, must establish realistic milestones, and must be publicly acceptable.

We believe Congress must act now to demonstrate to the public that the Federal Government can, as it has promised for many years, safely manage nuclear wastes. In fact, Congress should have acted much sooner. The expeditious demonstration, in the form of a geologic repository, of the technical ability to deal with high level radioactive wastes could go a long way toward restoring public confidence.

A comparison has been made between the bill passed by the House of Representatives last year with H.R. 1993, introduced by Mr. Lundine on February 23, 1981, and the discussion draft of a high-level radioactive waste management and policy act dated September 29, 1981. It is recognized that much has happened during the intervening months to bring the waste issues into sharper focus. H.R. 1993 was a useful effort to introduce legislation which would establish a waste management program. And to the extent that interagency review was needed, it provided direction. However, much of the required interagency planning for the repository has been completed, and it is now appropriate that a more focused program be established by legislation.

It is our view that the discussion draft offers substantial improvements to the bill passed in the last session of the House, and provides a project-oriented solution to the waste management problem.

It is our opinion that the discussion draft of the Bouquard-Lujan bill is a valuable basis for a bill which addresses a number of specific issues of concern to the industry. In particular, it provides for an expedited project decisions schedule, and a requirement that agencies comply with decisionmaking deadlines. It amends the hearing procedure prescribed by the Atomic Energy Act of 1954 for an application for a construction and operating license to provide a more efficient, tightly structured process. It integrates a test and evaluation facility with repository development programs, thus further expediting the development of the first repository.

It deals with the transitional storage of spent fuel by establishing interim storage of a limited amount of spent fuel on a contingency basis, taking advantage of available federally owned space to insure the continued operation of some nuclear powerplants. It provides for a workable, flexible mechanism for consultation and conferrence between Federal, State, and local organizations involved in various aspects of the program. Furthermore, States' rights may be implemented in the form of a written agreement.

It provides for financial compensation for States impacted by the establishment of a waste repository. We recommend that this be extended in appropriate cases to include compensation to affected host local jurisdictions.

It recognizes the unique nature of the licensing process, whereby one Government agency licenses the facilities of another Government agency, and defines the applicability of the requirements of the National Environmental Policy Act of 1969, to insure that the project decision schedule can be met. It contains a mechanism for industry funding of the actual repository used for the disposal of the wastes produced by commercial nuclear powerplants. It is a civilian program not affected by defense program needs.

In conclusion, we think that the discussion draft of a high-level radioactive waste management and policy act, dated September 29, 1981, goes a long way toward establishing the Federal waste management program which is so badly needed.

We commend this subcommittee for recognizing the need for a definitive Federal waste management program, and the legislation necessary to insure its implementation. We offer our assistance to the subcommittee in any way that we can help you in the future development of this legislation. The three of us would be pleased to answer any questions you have.

[The prepared statement Dr. Draper follows:]

STATEMENT ON BEHALF OF THE
AMERICAN NUCLEAR ENERGY COUNCIL
EDISON ELECTRIC INSTITUTE
UTILITY NUCLEAR WASTE MANAGEMENT GROUP
ON H. R. 1993
AND DISCUSSION DRAFT OF A
HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT AND POLICY ACT
BEFORE THE
SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES
OCTOBER 5, 1981

This statement is provided on behalf of the American Nuclear Energy Council (ANEC), the Edison Electric Institute (EEI), and the Utility Nuclear Waste Management Group (UNWMG). ANEC represents more than 100 organizations having an interest in nuclear power. The member utilities of EEI provide about 78 percent of the nation's electricity and serve over 67 million customers. The UNWMG is comprised of thirty-nine utilities with nuclear interests. The purpose of the Group is to interact with the Federal Government's programs relating to nuclear waste management and, where possible, assist the expeditious implementation of sound programs in this area.

Coordinated testimony was provided to this Subcommittee on behalf of these organizations earlier in the year with regard to other waste management legislation by Mr. R. Greg Snipes on February 26, 1981, and Dr. E. Linn Draper, Jr. on June 11, 1981.

This statement today discusses aspects of H. R. 1993 and a Discussion Draft dated September 29, 1981 on a "High-Level Radioactive Waste Management and Policy Act."

Each of the organizations: ANEC, EEI and UNWMG, have participated in efforts to resolve the nuclear waste management issue for several years, both in providing testimony to the Congress and providing input to the Executive Branch of Government. EEI and UNWMG are the primary industry participants in the Waste Confidence Rulemaking of the Nuclear Regulatory Commission.

A vital need of the electric utility industry in its ability to assure a continuing reliable supply of electricity to all citizens of the nation from nuclear power plants is for the nuclear waste management issue to be resolved expeditiously. Legislation is urgently needed to ensure that a comprehensive nuclear waste disposal program is established. There are several essential, basic considerations that must be recognized to assure an appropriate program: the program must transcend the political redirections of changing Congresses' and Administrations'; it must be technically conservative, it must have adequate financial resources, it must have specific milestones and the means to achieve them, it must contain specific commitments for the Federal Government to take the wastes on a cost reimburseable basis, and must be publicly acceptable. This is a difficult set of criteria, but it can be achieved and it requires comprehensive legislation to do so.

We begin with the proposition that nuclear power is, and will continue to be, a vital source of energy for baseload electricity generation. In the United States today we have 76 nuclear power plants with operating licenses with a rated capacity of almost 57,000 MWe. This installed electric generating capacity from nuclear power exceeds the entire installed capacity as it existed in the U.S. at the end of World War II. We now derive between 11 and 12 percent of our electricity in the U.S. from nuclear power and in some areas of the country, more than 50 percent. It is fortunate, indeed, that this is so when one examines our perilous dependence upon overseas petroleum supplies. Certain sections of our nation are especially vulnerable to the continued high prices of OPEC oil and to the threat of significant curtailment or cut-off of these foreign oil supplies.

Presently, we have 80 nuclear power plants under construction in the United States, representing 88,000 MWe of additional electric generating capacity. Of those 80 plants, over 30 are presently under operating license review. Those plants due to come on the line in the near future, together with our existing 76 nuclear plants, can and will make a significant contribution in assuring an adequate supply of electricity for our nation in the years to come.

These nuclear plants -- both presently operating and under construction -- represent an enormous financial investment by the American electric utilities in the beneficial development of a technology encouraged and promoted by the United States Congress and a number of Presidents as a source of safe, clean and relatively inexpensive energy for our homes, offices and industries. While some of the earlier optimistic expectations have not been realized, the contribution of nuclear power as a source of electric energy generation must not be underestimated. A measure of the economic worth of one large nuclear plant is the differential cost of generating the same electricity at a coal plant, which amounts to between $300,000 and $500,000 more per day in fuel costs. The differential cost for electricity produced from oil-fired plants is significantly greater. While we strive for greater energy conservation and look to energy resources other than oil, coal and nuclear, every responsible study of near and mid-term energy needs projects an expanded role for both coal and nuclear power for base load electricity generation.

Notwithstanding this universally acknowledged need, the potential contribution of nuclear power to U.S. energy supplies may not be fully realized, in large part because the public is losing confidence in the Federal Government's ability to resolve the waste management issue. The management and disposal of high-level radioactive wastes is a responsibility that the Federal Government has explicitly reserved to itself. The public seriously questions the ability of the Government to meet this commitment, in part, because of numerous policy changes and agency reorganizations which have resulted in fractionated and uncoordinated programs -- programs responsive to political pressures of the moment. For instance, the Carter Administration's 1977 decision to indefinitely defer reprocessing represented a major policy shift which complicated and added uncertainty to the Federal waste management program.

Nevertheless, a considerable amount of research and development work has been accomplished over the years. Much of the technology required to dispose of nuclear wastes has already been successfully demonstrated. International programs of commercial reprocessing and nuclear waste vitrification are currently in place, as are research, development and demonstration programs for permanent waste disposal.

Therefore, it is our view, and that of the informed and involved scientific and technical community, that the technology does indeed exist to enable the implementation of safe and environmentally acceptable waste management programs. More specificially, it is our view that there is enough information available to enable the Federal Government to proceed now on a conservative basis, to locate, design, construct and initiate the phased operation of a waste management system involving a geologic repository.

To quote from the National Academy of Sciences Report, Energy in Transition, 1985-2010, which was released January 14, 1980:

> No insurmountable technical obstacles are foreseen to preclude safe disposal of nuclear wastes in geological formations. All necessary process steps for immobilizing high- and low-level wastes have been developed, and there are no technical barriers to their implementation.

What is now urgently needed to ensure continuing progress towards early operation of the first geologic repository is a well-defined government plan of action. This Subcommittee is to be applauded for recognizing the importance of a national waste management plan through comprehensive legislative and for proposing actions designed to ensure its implementation.

To ensure the implementation of a national waste management strategy, a single lead agency is needed for the national program and an effective mechanism is required to assure the necessary coordination among the federal and state agencies involved. While we believe DOE is now committed to a responsible program for waste management, legislation is still needed to ensure that changes in administrations will not result in changes of direction and unnecessary delays as in the past. Legislation is required to define the role of the states and Indian Tribes, and to clarify the decision points at which compliance with the National Environmental Policy Act is appropriate and where possible streamline the NRC licensing process for repositories. We believe Congress must act now to demonstrate to the public that the Federal Government -- as it has promised for many years -- can safely manage nuclear wasts. In fact, Congress should have acted much sooner. The expeditious demonstration (in the form of a geologic repository) of the technical ability to deal with high level radioactive wastes will go a long way toward restoring public confidence.

We believe that an immediate resolution of the waste management issue is needed to assure continued public acceptance of nuclear power.

Proposed Legislation

A comparison has been made between the bill passed by the House of Representatives last year; H.R. 1993, introduced by Mr. Lundine on February 23, 1981; and the Discussion Draft dated September 29, 1981 on a "High-Level Radioactive Waste Management and Policy Act." It is recognized that much has happened during the intervening months to bring the waste issue into sharper focus. H.R. 1993 was a useful effort to introduce legislation which would establish, although overly complex, a waste management program and, to the extent that interagency review was needed it provided direction. However, much of the required interagency planning for the repository has been completed and it is now appropriate that a more focused program be established by legislation. The Discussion Draft offers substantial improvements to the bill passed in the last session of the House and provides a focused solution to the waste management problem.

It is our opinion that the Discussion Draft is a valuable contribution in addressing a number of specific issues of concern to the industry; in particular:

- It provides for an expedited project decision schedule and a requirement that agencies comply with decision making deadlines.
- It amends hearing procedure prescribed by the Atomic Energy Act of 1954 for an application for a construction and operating license to provide for a more efficient, tightly structured process.
- It integrates a test and evaluation facility with a repository development program, thus further expediting the development of the first repository. This facility could provide evidence to the public that indeed the necessary technology for waste disposal does exist.
- It addresses the transitional storage of spent fuel by establishing interim storage of a limited amount of spent fuel on a contingency basis, taking advantage of available Federally owned space to ensure the continued operation of some nuclear power plants.
- It provides a workable, flexible mechanism for consultation and concurrence between Federal, state and local organizations involved in various aspects of the program.

Furthermore, state's rights may be implemented in the form of a written agreement.

- It provides financial compensation to the states impacted by the establishment of a waste repository. We recommend that this be extended in appropriate cases to include compensation to affected host local jurisdictions.
- It recognizes the unique nature of the licensing process whereby one government agency licenses the facilities of another government agency, and defines the applicability of the requirements of the National Environmental Policy Act of 1969 to ensure that the project decision schedule can be met.
- It contains a mechanism for industry funding of the acutal repository used for the disposal of wastes produced by commercial nuclear power plants.
- It is a civilian program not affected by defense program needs.

Against the backdrop of these items, a further elaboration is provided upon several important issues which any legislation concerning the implementation of a national waste management program must address: 1) State Participation; 2) Interim Spent Fuel Storage; 3) Geologic Repositories and Site Characterization; and 4) Financing Spent Fuel Storage and High Level Waste Disposal. We would now like to address these issues:

1. STATE PARTICIPATION

The issue of state participation in the siting and construction of permanent waste facilities or interim away-from-reactor spent fuel storage is a preeminent institutional issue which needs to be resolved in implementing a national nuclear waste management program. While the disposal of nuclear waste is a national problem and federal responsibility, we recognize that the states and in some instances Indian Tribes have a legitimate interest in the way in which it is resolved. Therefore, we believe an opportunity for constructive state participation is an essential element of the federal waste management program. The need for state participation is recognized in all of the bills presently before this Subcommittee.

The role of the states in federal decision-making is a delicate and sensitive area, and the resolution of this issue presents a clasic test of our federal system of government. We believe a cooperative federal-state relationship can be fashioned which equitably balances the legitimate interests of the states and the national interest. We do not believe, however, that it is necessary to institutionalize this federal/state relationship in the form of the Boards suggested in Sections 105 and 106 of H.R. 1993. We prefer the approach whereby DOE and individual host states arrive at a "cooperative agreement." Such an agreement will implement the rights of states to participate in a process of consultation and coordination, based on public health and safety concerns, in the principle stages of the planning, siting, development, construction and operation of a site.

Furthermore, siting waste repositories is certainly not the only issue where state and local wishes must be balanced against the broader national interest. The Congress should carefully consider the historical federal-state relationships and the precedential nature of this legislation. There are a number of principles which we believe should serve as guidelines for constructive state participation without eroding the overall federal interest. In part we looked to the 1978 amendments to the Outer Continental Shelf Lands Act in developing these principles:

1. Potential host states should be able to participate early in the siting process; however, no state should be able to prevent a federal agency from performing exploratory work, including drilling, to identify and characterize potentially favorable national repository sites.
2. Federal assistance should be provided to the potential host states to develop the technical expertise to allow the states to participate in the siting process in an informed and constructive manner.
3. States should be provided the opportunity to submit recommendations to the responsible federal agency relating to environmental protection, health and safety issues, or fiscal and social impacts. The responsible federal agency should be required to accept the state's recommendations if it determines, after having provided the opportunity for consultation, that they provide for a reasonable balance between the national interests and well-being of the

citizens of the affected state. The federal agency should communicate to the state, in writing, the reasons for its determination to accept or reject the state's recommendations, or to implement any alternative means identified in consultation with the state to provide for a reasonable balance between the national interest and the well-being of the affected state.

Based on these principles, we support a process that requires the DOE to notify, consult, and coordinate with the affected states wherein a potential site for a repository has been identified. Such a process should be meaningful and substantive. DOE should be authorized to enter into agreements of understanding with the states which clearly define the process and the responsibility of the parties involved.

Any state veto would be against the national interest, even if such a veto were coupled with a federal override by the President or Congress. An outright state veto may unduly delay progress towards resolving the waste management issue.

Financial assistance should be provided to assist State and local governments of areas affected by waste disposal facilities to offset any direct or indirect costs incurred because of environmental, economic or other impacts. Funds for such assistance should be a component of the fees collected from the utilities for waste disposal.

2. INTERIM SPENT FUEL STORAGE

UNWMG, ANEC, and EEI have strongly supported the creation of interim off-site spent fuel storage capacity by the Federal Government. DOE's own studies point to a need for spent fuel storage by 1986. While alternative on-site storage technologies might allow some postponement of critical off-site storage dates for some reactors, they are not likely to be of near-term help. A federal near-term option should therefore be maintained. Some form of spent fuel storage will be needed to accommodate the spent fuel backlog, regardless of which steps are taken to close the back-end of the nuclear fuel cycle.

Obviously, sooner or later utilities will no longer have room to store additional spent fuel in existing at-reactor spent fuel pools. Prior to that time, some other location or locations for storing spent fuel will be needed to insure continued reactor operation.

In the near term -- through 1990 -- there are limited options for providing additional spent fuel storage capacity. Of the several options considered -- reprocessing, pin disassembly, dry storage, transshipment, new at-reactor pools, new off site storage facilities, use of existing storage facilities -- only the use of existing facilities appears to be available prior to 1990. Additionally, the economies of scale that should be available for centralized storage facilities that can accommodate the needs of many reactors are desirable to minimize the costs to electric rate-payers. Regional facilities are the most sensible near-term solution, and it is a near-term solution which is sorely needed. We support the establishment of at least one federal storage facility. It would be beneficial, however, to operate several so that they could be located on a regional basis.

The logical approach is for federal operation of interim spent fuel storage facilities. This alternative has both logic and equity. It was the delays in federal decision-making and the changes in federal policies which created the spent fuel storage problem. New regulatory policies, extended licensing proceedings, and the Carter Administration's indefinite deferral effectively destroyed the privately financed commercial reprocessing option. Also, federal delays in implementing a waste management strategy resulted in the facilities for the permanent disposal of spent fuel or high level radioactive waste not being available until at least the late 1990's. Thus, it is quite reasonable for the Federal Government to take the steps necessary to overcome the near-term gap between storage needs and storage capability.

TVA has indicated its intent to construct its own additional spent fuel storage capacity. TVA, of course, has some advantages over the private utilities in both financing and in less regulatory oversight. Furthermore, what may be economical for TVA at large multi-unit plants is not similarly economical at smaller single unit facilities. A number of utilities would be very interested if TVA would consider expanding its spent fuel storage plans to include accepting spent fuel from private or other public utilities.

The spent fuel storage issue must be dealt with not only in context of the immediate need for interim storage capacity, but also in deciding how to deal with the valuable and strategic energy reserve contained in the spent fuel. Based on the latest DOE estimates of spent fuel which will be generated prior to the year 2000, the EEI has calculated that the recoverable energy content of this spent fuel -- if only recycled once for use in present light water reactors -- will equal the energy equivalent of nine billion barrels of oil. (This compares with the less than one billion barrels envisioned for the strategic oil reserve.) The capability for longer-term, retrievable spent fuel storage would serve as a strategic energy reserve, husbanding the energy resources inherent in the spent fuel. The cost of this strategic reserve would be paid for only by the utilities who deliver the spent fuel. Spent fuel would be held in trust by the Federal Government both to ensure the security of high level radioactive waste and to conserve the considerable energy resources contained in the spent fuel for future generations.

3. GEOLOGIC REPOSITORIES AND SITING CHARACTERISTICS

Contrary to the public's perception that little progress has been made in solving the waste management problem, a considerable amount of research and development work has been accomplished during the past few years. The technology required to dispose of nuclear wastes has already been developed. Key steps in the process are today in operation on a commercial scale both in this country and abroad. The technology does indeed exist to enable the implementation of a safe and environmentally acceptable waste management program.

One of the conclusions of the International Fuel Cycle Evaluation (INFCE) study group was that radioactive waste disposal can be carried out without undue risk to man or the environment. In fact, there appears to be a growing consensus among both critics and proponents of nuclear energy alike that it is the institutional issues, rather than the technical ones, that pose the greatest risk of delaying implementation of waste management strategies. It is time that we progress from the research phase and enter the operational phase of nuclear waste management. It will, however, require Congressional action to resolve the institutional barriers which impede this progress.

The reasons why the utilities have consistently urged the Federal Government to implement promptly a waste management program are principally neither economic or technical. Spent fuel can continue to be stored safely and relatively inexpensively in spent fuel storage pools, both at reactor sites and at other locations. Both spent fuel and vitrified high level wastes can be stored for centuries safely in above-ground or sub-surface "temporary" storage. From a resource conservation disposal standpoint, it makes little sense to dispose of spent fuel permanently, with its enormous energy value. Until spent fuel is reprocessed on a large scale with the generation of high level radioactive wastes, there is not a great volume of wastes available for permanent disposal. Despite this, however, the public equates the absence of a disposal facility with the absence of a solution to the nuclear waste management "problem". In several states, this perception has been translated into prohibitions on future reactor licensing. The best way to change this perception is to have one acceptable permanent waste management facility in being. Once the public can see a geological repository under way, we believe that this perception will change.

A fast way to demonstrate to the public that the technology exists to dispose of nuclear wastes in a safe manner is to establish a test and evaluation facility ("TEF"). As we understand DOE's current planning with respect to the role and function of a TEF, it is that the construction and operation of such a facility is not primarily directed at site characterization but rather to the engineering and operational aspects, such as waste handling, emplacement, and back fill. In our view very useful information related to site characterization could also be acquired at the same time. Such information would relate to host media characteristics and its behavior close to the waste package in response to thermal loading.

In our view a TEF must be fully integrated into the overall waste management effort leading to the construction and operation of a full-scale, geologic repository. A TEF should not be a separate program but rather an extension of unlicensed activities as are contemplated by the Nuclear Regulatory Commission's rules for licensing a geologic high level waste repository (10 C.F.R. Part 60). Thus, we could support the concept of a TEF that does not delay the overall geologic repository program or add significant costs to the waste management program, but rather contributes to timely site characterization, evaluation and licensing activites at a proposed repository site.

On the subject of high level waste disposal, we would like to interject a word with respect to the regulatory approach being taken by NRC and EPA. The position of the industry -- and DOE -- has been for some time and continues to be that the disposal of high level wastes must be viewed on an over-all systems basis taking into account engineered barriers in a geologic repository. The required containment and isolation of the wastes are to be accomplished by the total performance of all the components of the system; not necessarily any single component. Regulatory requirements should reflect this reality. Much research has already been done on a systems-basis, and the suitable technology already exists to construct an entirely adequate system. Reliance on a systems approach is completely consistent with the views that have been put forth by other authoritative groups. Yet proposed rules of NRC and EPA would set standards for single components rather than standards for the system as a whole. We believe such an approach is not technically reasonable or necessary for protection of the public's heath and safety.

Finally, we would like to add a word about National Environmental Policy Act (NEPA) considerations. Any legislation on nuclear waste management should make clear what constitutes and what does not constitute a major federal action for NEPA purposes. It is our view that actions short of the final site selection by DOE for a permanent repository and licensing of a permanent repository by the NRC should not be considered to be major federal actions. None of the bills presently under consideration give an adequate explanation of the interaction between NEPA and the process for establishing waste management facilities, although the need for addressing NEPA is recognized. Environmental studies would, of course, be conducted by DOE during the site selection process, but a full-scale NEPA environmental impact statement (EIS) should not be required until final site selection has taken place and authorization of the Congress is requested for construction of a repository. This is the decision point at which relevant information on environmental impacts and alternatives should logically be presented to the decision-makers in a formal, final EIS after public participation in that process. To require one or more EIS's earlier in the process in an unnecessary burden on the site selection process and would retard the repository program significantly.

It is also essential that all discussions of environmental assessments be clearly indicated as not adding additional substantive law regarding environmental reviews but rather is described as clarifications of how DOE must comply with NEPA. Otherwise a court would hold such a provision to be an additional substantive provision in law and read into it procedural requirements and substantive standards never contemplated by Congress.

Consequently, we encourage the concept of clarification of NEPA requirements. Environmental considerations need be carefully considered but NEPA should not be a procedural quagmire and instrument of needless delay. In particular, with regard to spent fuel storage, NEPA considerations should be limited to site specific considerations only. A Congressional finding to this effect can be supported by the detailed analyses in generic environmental impact statements on spent fuel storage prepared by the NRC and the DOE. (See U.S. Nuclear Regulatory Commission, Final Generic Environmental Impact Statement

On Handling and Storage of Spent Light Water Reactor Fuel, NUREG-0575 (August, 1979); U.S. Department of Energy, Final Environmental Impact Statement: U.S. Spent Fuel Policy, DOE/EIS-0015 (May 1980).

4. FINANCING SPENT FUEL STORAGE AND HIGH LEVEL WASTE DISPOSAL

The financing plan which we support covers the entire waste management program. It applies to interim spent fuel storage facilities, test and evaluation facilities, and geologic repositories. The central concept of the financing plan which we support is premised on complete cost recovery of all reasonable facility costs. It is essential to the utilities operating nuclear facilities that a predictable and prospective payment approach be set up. The rate making procedures and accounting procedures which the utilities use make any other financing plan extremely difficult and impractical.

A payment would be made in full for all reasonable costs associated with storage and disposal facilities each time the utility delivered spent fuel or high level radioactive wastes to the Federal Government. We support a provision whereby the Federal Government would take delivery of spent fuel at a reactor site, or high level waste at a reprocessing plant, transport the material to a federal interim facility or repository for storage, and dispose of the waste products associated with such spent fuel. Each payment in full would be calculated at the rate of "x" per unit of spent fuel. The charge would include a proportionate part of the costs of the construction and the operating, maintenance and decommissioning of federal interim storage facilities, and a proportionate part of the cost of permanent disposal of high level radioactive waste associated with spent fuel.

The utility should retain a non-transferable right to the value of the remaining fuel resources minus the costs of recovery. Title to the spent fuel would pass to the Federal Government when it takes possession of the spent fuel at the reactor site or high level waste at the reprocessing plant. This would avoid challenges at state and local levels to transportation of spent fuel and high level waste.

The per-unit charge would be re-calculated periodically in order to reflect revised costs. Notice of this increase would be published in the Federal Register for comment by interested parties. The change would apply prospectively to spent fuel as delivered to the Federal Government within the specific year for which the charge applies.

An alternate approach that may be acceptable to the utility industry is to collect a specified amount from the rate-payers, as a component of fuel costs, of a prospective fee per kilowatt-hour when electricity is generated by nuclear power. Under such an arrangement, a means is required to accommodate a one-time fee into the waste management account of the Federal Government at the time of delivery of spent fuel or radioactive waste from spent fuel removed from reactor cores prior to enactment of legislation. With regard to a possible approach of a fee based on kilowatt hour generation, the utility industry is not enthusiastic about serving as tax collectors for the Federal government; in fact, we view it as an undesirable precedent. While the electric utilities do not endorse the precedent of collecting a tax, we recognize that nuclear waste management is a unique Federal responsibility resulting from joint effort of the government and industry to utilize nuclear energy for the public benefit. Such a financing arrangement is not viewed as a precedent, but rather an innovative mechanism for ensuring the financial viability of a successful long-term Federal waste management program.

In considering the financing of the waste management program, we are certainly aware of the commendable fiscal restraint being exercised by the Congress in all areas of government spending. Again we must emphasize that the full payment for reasonable costs of storage and disposal of commercial spent fuel and radioactive wastes will be paid by the utilities and will be included as part of the cost of the nuclear fuel. To alleviate near-term budgetary impacts, the utilities may be willing to make a substantial commitment upon signing a contract with the Federal Government for spent fuel storage at interim facilities and to commit to ship sufficient spent fuel to an interim facility to ensure all Government costs are recovered.

The Federal Government should be required to enter into contracts with persons licensed under the Atomic Energy Act of 1954, as amended, for the interim storage and disposal of waste or spent fuel. The contract should specify the basis for the payments to be made under each contract and must include a specific date upon which the Federal Government would take title and possession of waste or spent fuel as well as the criteria for such title transfer.

CONCLUSION

In conclusion, we would like to emphasize the need for action by Congress this year in implementing a federal waste management program. Interim spent fuel storage capability should be provided as soon as possible. The site selections for proposed geologic repositories, and a test and evaluation facility at one of the proposed locations, should proceed on an expedited program. The desirability of long-term retrievable spent fuel storage capacity must be recognized in light of the energy values contained therein. A definite schedule for progress such as that laid out in the Discussion Draft would help in ensuring that present action be taken quickly and that future action not be delayed. A "schedule of events" is needed to ease a federal waste management policy into reality.

It is essential that legislation be enacted to ensure that a comprehensive nuclear waste disposal program is established. Without such legislation, the issue of state participation in the selection and operation of facilities will remain unresolved. Furthermore, without legislation on the subject clarifying when NEPA is appropriately applied, any program undertaken by the Federal Government could be challenged ad infinitum on NEPA grounds. These issues must be confronted, and a program implemented.

Mrs. **Bouquard**. Thank you very much, Dr. Draper, for your very positive statement.

On page 3 of your testimony, you say that to insure the implementation of a national waste management strategy, a single lead agency is needed for the national program. Are you referring to DOE? Or do you have another lead agency in mind?

Dr. **Draper**. We are referring to the Department of Energy. We believe the existing institutions are adequate; however, were a separate agency to be established to manage radioactive waste, we would certainly support that sort of activity as well.

Mrs. **Bouquard**. You refer to changes in administration that might result in changes of direction. Do you think we can sufficiently address this concern to DOE?

Dr. **Draper**. I think it's possible that that could be done. If the Department of Energy were given a firm schedule and were given adequate funding to support the program over an extended period of time, I believe the existing institutions could, in fact, do the job. One of the deficiencies in the past has been the lack of a firm schedule, to which the Department of Energy was charged to work, and the lack of an established program for the financing of that activity.

Mrs. **Bouquard**. Do you think that the NRC should be involved in the program from the very inception of the schedule?

Dr. **Draper**. I do. I think it would be very useful to have the NRC involved from the outset, so that those issues that were likely to occur in licensing hearings and other proceedings would be addressed early on and could be worked out in a cooperative way.

Mrs. **Bouquard.** Dr. Draper, do you think the hybridized system for intergovernment licensing of the repository is appropriate, considering the fact that DOE and NRC are both separately responsible for protecting the public health and safety, and also considering the fact that DOE, being a Government agency, is not profit-oriented, and can be trusted to design and construct and operate this repository in the best interests of the country?

Dr. **Draper.** Yes. I see no reason to expect that not to be a successful situation.

Mrs. **Bouquard.** I'd like to ask you, also, do you believe that the exception for ex parte communications between NRC and the Secretary is needed?

Dr. **Draper.** I do, for reasons that we discussed a moment ago, that it's vital that there be early on discussions between the Department of Energy and the NRC. Those would likely be just as valuable after the licensing proceeding were underway.

Mrs. **Bouquard.** Do you believe it would be helpful in terms of expediting actions to have NRC closely involved in the DOE work, before receiving the official license?

Dr. **Draper.** Yes.

Mrs. **Bouquard.** Do you also support the fixed payment schedule?

Dr. **Draper.** Yes.

Mrs. **Bouquard.** Do you believe the consultative role for NRC, the States, and the tribes will be helpful in keeping the project going in a more timely manner?

Dr. **Draper.** Yes, I do.

Mrs. **Bouquard.** One other final questions. Do you believe that we need another State planning council, an interagency review group?

Dr. **Draper.** No, I don't.

Mrs. **Bouquard.** Why do you think that we do not?

Dr. **Draper.** I think that those issues that are likely to be raised by the State planning council and the interagency review group have been raised, and people are sensitized to those issues. I believe that the draft legislation provides mechanisms by which the interests of those parties that would logically be represented by those groups can, in fact, be represented.

Mrs. **Bouquard.** Do you think an arbitration board is necessary, as proposed in H.R. 1993?

Dr. **Draper.** I think not. My understanding of the arbitration board would be one that would principally settle technical issues. I believe there is ample demonstration that the technical issues can be agreed to by the State, by the Department of Energy, and others. I believe the political issues are the more troublesome ones, and I believe that the mechanism provided for in the draft legislation, namely, the recommendation by the Secretary to the President, and then having the opportunity for Congress to reconsider, is an adequate way to represent the interests of the States.

Mrs. **Bouquard.** Thank you very much. Mr. Lundine.

Mr. **Lundine.** I think, Dr. Draper, you were here for Mr. Cotton's testimony; were you not?

Dr. **Draper.** Yes, I was.

Mr. LUNDINE. Do you essentially agree that linking an action plan with a financing mechanism is the real fulcrum of what needs to be done, in terms of getting a comprehensive waste management program going?

Dr. DRAPER. I think that in any issue that is likely to be of a duration of many years, as the waste management enterprise will be, it is useful to have a long-term plan, so I certainly support that sort of an activity. I don't think it would be useful to embark upon a long-term program without a clearly defined plan at the outset and adequate funding to insure that that plan could be implemented.

Mr. LUNDINE. So all of your very useful commentary about specifics presumes that we will have a definite stated idea of where we're going, and that there will be a timeframe set up at the outset that hopefully is realistic, to put us on a definite track toward ultimately being able to dispose of the waste?

Dr. DRAPER. Yes, sir, I do. And I think that the draft legislation proposed by Mrs. Bouquard and Mr. Lujan contains the essentials that one would go from in the establishment of a detailed plan. The schedule is discussed in this particular draft legislation, and I believe it has the essential elements herein. I believe that more detail would logically then be added to it, to come up with a detailed plan.

Mr. LUNDINE. Other than what you've already been asked—I don't want to be redundant, because I've listened carefully—is there any criticism either of the bill I introduced or the discussion draft put forward by Mrs. Bouquard and Mr. Lujan? Any constructive criticisms that you would offer, other than the things that have already been covered?

Dr. DRAPER. I think there are a number of details that the industry would be interested in discussing as to the implementation of the program. For example, the financing of the enterprise would be in some way supported by the electric utility companies and ultimately the ratepayers, and what exactly would be included in the recovered costs, I think is a point that needs some consideration. What fraction of the research and development effort is appropriately charged to the electric utilities and that sort of thing.

But in broad terms, I believe that we have no major objections to the draft legislation as we see it here.

Mr. LUNDINE. I might say that I really want to compliment you—this is not a question—for not only accepting but supporting the idea of industry funding of the actual repository. You don't always see that kind of enlightenment in this area, and I really wish to compliment you.

Dr. DRAPER. Thank you, sir. I don't recall ever having been called enlightened before. That's very nice. [Laughter.]

Mr. LUNDINE. We're dealing with highly radioactive substances here. Really, your members and associates are bearing the brunt of the time clock ticking without a resolution of these issues, particularly, with regard to spent fuel, and your pool's filling up. I guess I want to ask two questions. One is general. At this point in time, what is your posture with regard to the real problem of spent fuel accumulating and the storage pools maybe being at capacity without a solution, whether it be reprocessing or away from reactor storage or some other storage? How do you assess that generally, and specifically, what do you think of the idea of some dry storage at the reactor site?

Dr. DRAPER. Let me give a very brief answer and ask Bob Calabro to address that. He's the chairman of our Spent Fuel Working Group, and deals with that on a daily basis.

It's necessary to recognize that the various utilities that are in the nuclear business have vastly different problems. Some of the utilities are only now constructing plants, whereas some plants have been in operation for many years. It's primarily those that are approaching capacity in their spent fuel that are addressing in great detail what might be done in the short term with spent fuel. They clearly have a problem. We need a resolution of that problem in the short term to assure that those reactors will not, in fact, have to shut down because of inadequate capacity.

With that sort of preamble, let me ask Bob to comment on what the situation is.

Mr. CALABRO. By the Department of Energy's own estimates, there's a need for spent fuel storage, starting in about 1986. That's based on maintaining a full core reserve margin for each of the reactor sites. As Dr. Draper has said, each individual site is somewhat different. Dry storage would be one of the possible contingency plans to which utilities are looking today for additional storage, but it's not necessarily applicable to every specific site.

To give an example, the question technically, what kind of dry storage? One alternative would be to take spent fuel assemblies, place them in a large shipping cask or large cask and place them outside of their building. Some sites may not be able to be licensed with that kind of a storage concept.

Another dry storage concept is to build silos underground. Again, that's a site specific type of problem. Some reactor sites may not be able to go forward with that mode. Each specific site, depending upon the design, depending upon the seismic criteria for that site, whether it's on or near an ocean or near a river, has specific types of requirements which include some of the types of technical additional ~~storage c~~apabilities.

Mr. LUNDINE. Can you make any generalizations about those utilities that are approaching the problem in the nearest term and their feasibility in terms of using some dry storage?

Mr. CALABRO. It's my understanding that some utilities will not be able to use dry storage before 1990, because of their particular sites.

Mr. LUNDINE. Some of them who are going to have their reactor pools filled before 1990.

Mr. CALABRO. Before 1990.

Mr. LUNDINE. Thank you. I have no more questions.

Mrs. BOUQUARD. Thank you. Mr. Goldwater.

Mr. GOLDWATER. Dr. Draper, how far will the utilities be willing to go in paying for these repositories? Would they be willing to pay for the test and evaluation facility?

Dr. DRAPER. I think it is likely that they would. I think the utilities are willing to bear any reasonable cost that can be attributed to the disposal of commercially generated radioactive waste. What they probably would not be willing to pay for are very advanced or baseline R. & D. activities that might be expected normally to be in a Government R. & D. program.

Mr. GOLDWATER. Do you see a cost sharing in the repository itself, or do you feel that maybe this is something the utilities ought to handle 100 percent?

Dr. DRAPER. I think if the repository is a repository for commercially generated waste only, that is, that no Defense wastes are placed in the repository, that the utilities would be willing to bear the cost.

Mr. GOLDWATER. The organization you represent does not want to get back into reprocessing. Is this something you feel is a Government function? Is that pretty much the attitude?

Dr. DRAPER. The organizations that I'm representing here today are organizations of electric utility companies or organizations that have other members that have something to do with the nuclear business. I think that none of those organizations as an entity is interested in reprocessing nor have they ever been, in terms of owning the reprocessing facility.

I think that I could broaden the statement slightly to say, though, that those companies that have in the past been interested in reprocessing are very reluctant at this point to spend additional funds to develop reprocessing, because of the vulnerability of that technology to governmental actions.

We've seen in the past on several occasions that companies that were quite willing to take normal business risks in developing reprocesssing were subjected to very abnormal risks by Government policy changes. That is, reprocessing plants were constructed and ready to operate but not allowed to because of policy decisions by the Federal Government. Because of that, I think it would be very difficult to get any organization at this point to commit large amounts of funds to develop reprocessing in the commercial sector. It's simply too risky a business from the perspective of being regulated by the Federal Government.

Mr. GOLDWATER. We've had testimony that indicates that the NRC and the Department of Energy seemingly have a better working relationship, a more cooperative arrangement. Do you, as an observer of this process, find that to be true?

Dr. DRAPER. Yes.

Mr. GOLDWATER. Why do you think that is?

Dr. DRAPER. I think it's a reflection of the enthusiasm of the current administration and Congress' will that we get on about the business in energy in general and nuclear energy in particular and solve some of the outstanding problems.

Clearly, the disposal of radioactive waste is an outstanding problem that must be solved, and I believe that the Department of Energy and the Nuclear Regulatory Commission have recognized that and are taking some action. I believe that legislation such as the proposed draft bill would go a long way toward augmenting that activity. If a time line is established and funding is established, I think that will be very beneficial to the furtherance of the activity that's already under way.

Mr. GOLDWATER. Thank you, Dr. Draper, Mr. Snipes, and Mr. Calabro very much.

Mrs. BOUQUARD. Thank you, Mr. Goldwater. Mr. Volkmer.

Mr. **Volkmer**. Thank you, Madam Chairman. I have a question to carry on for the gentleman from California. It appears to me, Mr. Draper—and others can answer me—from my belief, what I'm hearing and what I've read, that the permanent type of disposal site you envision is to dispose of the fuel rods without reprocessing.

Dr. **Draper**. It would be our hope that we would in this country in some fashion develop a reprocessing industry that would reprocess the spent fuel. We think that would have two very beneficial effects. One, it would make the waste form somewhat smaller in volume and slightly more tractable, in the sense that it might be more stable.

The second clear advantage of reprocessing is that the fuel values that are present in the spent fuel could be removed and used for further reactor operation. So our hope would be that reprocessing would, in fact, come about, that solidified waste would be the medium placed in the ground. It's our observation, however, that we do not now have a reprocessing industry. And until such an industry is in place, it might very well be that spent fuel would be the entity that was placed in the repository.

Mr. **Volkmer**. But from what I can see, and I'm sure from what you can see down the road, where are we going to have the reprocessing facility?

Dr. **Draper**. I think that it will take some substantial changes in the way we have viewed reprocessing in the past, whether it's by a quasi-governmental corporation or whether by some other mechanism that can assure long-term stability of the reprocessing enterprise to make it attractive as a normal business venture, I don't know.

Mr. **Volkmer**. Economically, it's not attractive.

Dr. **Draper**. It's clearly not attractive in today's environment; that's correct.

Mr. **Volkmer**. That's what I'm trying to get to.

Then what we're talking about is basically methodology to store spent fuel.

Dr. **Draper**. I think that that's a fair assessment, at least in the short term.

Mr. **Volkmer**. Thank you.

Mrs. **Bouquard**. Thank you, Mr. Volkmer. Mr. Young.

Mr. **Young**. Thank you, Madam Chairman.

Dr. Draper, it's a pleasure to see you again, and I'm sorry that I was unable to be here for all the testimony on this vitally important subject, but I'd like to state my strong support for the nuclear waste management legislation and to commend our chairperson, chairwoman, and Mr. Lujan and Mr. Lundine for their hard work to develop some legislation on this subject.

Dr. Draper was kind enough, Madam Chairman, to take the time to be with me in St. Louis in August for an energy conference, and he was very ably presenting the need for continued increased use of nuclear power during our afternoon session. For the information of the committee—and maybe Dr. Draper would respond just briefly—at the end of the day we requested the participants at the conference reply to a questionnaire on energy. Among other questions, they were asked to rank national energy goals in priority order. The goals ranged from reducing oil imports to expanding coal production, to increased funding for solar energy, to constructing and operating a facility for the permanent storage of radioactive waste.

Among the 10 choices that we listed, constructing and operating a facility for permanent storage of radioactive waste ranked first. An overwhelming 80 percent of those responding believed that the highest priority should be assigned to this energy goal. It is obvious to me that my constitutents want this problem solved, and I believe they are typical of most American citizens.

Do you find this, Dr. Draper, throughout the country, in the seminars that we had, is this kind of a very strong feeling throughout the country?

Dr. **Draper**. Yes, indeed, Mr. Young. Thank you for your kind words. I thoroughly enjoyed being in St. Louis with you. I think the experience there is typical of those around the country. That is, the public is quite skeptical of the ability to manage high level radioactive waste. They perceive our inaction as inability to act. I think that's wrong. I think we know how to do it, and I think the mission at this point should be to get on about the business of doing it, so the public confidence will be restored.

Mr. **Young**. Thank you very much. Thank you, Madam Chairman.

Mrs. **Bouquard**. Thank you very much, Mr. Young. I'd like to add, too, that I don't think we have any two harder working, more conscientious, or more diligent members on this committee than my colleagues from Missouri. They're very active participants in all of our activities. And I certainly appreciate their participation.

I have one final question, Dr. Draper.

Will the utilities be able to pass through the contract charges for repository development in the rate base, as we anticipate in the Bouquard/Lujan proposal?

Dr. **Draper**. That can only be resolved at each individual public utility commission or its counterpart in each of the several States, but I would expect that that would be viewed as a normal cost of doing business and would, in fact, be allowed as a current expense. I don't expect that would be a difficulty.

Mr. **Volkmer**. Madam Chairman, would you yield on that point for a moment. I'd just like to say when we're talking about the contributions by the utilities, we're talking about on nuclear power; are we not?

Dr. **Draper**. Yes. I would expect that the charge would be accessed on the basis of the kilowatt-hours of nuclear-generated electricity.

Mr. **Volkmer**. I just wanted to clear that up.

Mrs. **Bouquard**. Thank you. Mr. Snipes, did you want to comment on that?

Mr. **Snipes**. I would certainly like to add to Dr. Draper's comments on that particular point. I believe it will be much easier to pass such charges through to our customers if there is an identified schedule for acceptance by the Federal Government of the waste, upon payment of the defined charge, and that that charge be set, periodically adjusted, but not retroactively adjusted to apply to fuel, which has already been discharged from the reactor.

Mrs. **Bouquard**. Thank you very much.

Is there any further comment which you gentlemen would like to make?

[No response.]

Mrs. **Bouquard**. If not, I certainly thank you for being with us, for your very valuable testimony and for your interest in this very vital legislation.

The subcommittee will reconvene on Wednesday, I think, in this room, at 1:30.

[Whereupon, at 5:05 p.m., the hearing was adjourned.]

97TH CONGRESS
1ST SESSION

H. R. 1993

To provide for the development of a plan for the disposal of radioactive waste and spent nuclear fuel, to require the construction of repositories in accordance with the plan, to establish a Federal policy regarding the interim storage and commercial reprocessing of spent nuclear fuel, to provide for a demonstration program for dry storage of such fuel, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 23, 1981

Mr. LUNDINE introduced the following bill; which was referred jointly to the Committees on Energy and Commerce, Interior and Insular Affairs, Rules, and Science and Technology

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A BILL

To provide for the development of a plan for the disposal of radioactive waste and spent nuclear fuel, to require the construction of repositories in accordance with the plan, to establish a Federal policy regarding the interim storage and commercial reprocessing of spent nuclear fuel, to provide for a demonstration program for dry storage of such fuel, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Radioactive Waste Research, Development, and Policy Act."

FINDINGS AND PURPOSES

SEC. 2. (a) The Congress finds that:

(1) Radioactive wastes pose a potentially serious threat to the environment and to the expanded utilization of nuclear energy.

(2) A comprehensive national strategy to safely manage and dispose of our radioactive wastes has not been fully developed or accepted among Federal agencies, individual States, and interested citizens.

(3) Primary responsibility for the interim management of spent nuclear fuel from commercial reactors rests with the private sector.

(4) Only the Federal Government has the technical resources to provide a solution to the problem of permanently isolating radioactive wastes from the environment.

(5) The costs of permanent disposal of radioactive wastes should be provided by the persons or entities which generate such wastes through payment of a fee charged at the time the waste is generated.

(6) The individual States must become an integral part of the planning process for disposing of radioactive wastes.

(7) Deferral of commercial nuclear reprocessing has not significantly contributed to progress toward establishing an international nonproliferation policy.

(b) It is the purpose of this Act:

(1) To establish a national mission plan for the disposal of radioactive wastes.

(2) To establish a Federal policy toward the interim storage and reprocessing of commercial spent nuclear fuel.

(3) To provide for a demonstration program for dry storage of spent nuclear fuel.

(4) To provide for the establishment of a utility trust fund to pay for the costs of carrying out the mission plan.

(5) To provide for a procedure to assure adequate consultation and involvement of individual States and Indian tribes regarding potential repositories within their borders.

(6) To authorize payments to States within whose borders radioactive waste disposal facilities are sited.

DEFINITIONS

SEC. 3. For purposes of this Act:

(1) The term "high-level nuclear waste" means the highly radioactive wastes resulting from the reprocessing of spent nuclear fuel, liquid waste which is produced directly in reprocessing, any solid material into which such liquid waste is made, and such other highly radioactive material as the Commission designates as high-level radioactive waste following a determination that such designation is necessary to protect the public health and safety.

(2) The term "Independent Review and Arbitration Board" means the Board established by section 105.

(3) The term "Indian reservation" means—

(A) the Indian reservations and dependent Indian communities referred to in clauses (a) and (b) of section 1151 of title 18, United States Code; and

(B) lands selected by Alaska Native villages or regional corporations under the provisions of the Alaska Native Claims Settlement Act.

(4) The term "Indian tribe" means any Indian tribe, band, nation, or other organized group or community of Indians recognized as eligible for the services provided to Indians by the Secretary of the Interior because of their status as Indians, including any

Alaska Native village, as defined in section 3(c) of the Alaska Native Claims Settlement Act (43 U.S.C. 1602).

(5) The term "intermediate scale repository" means any repository described by section 103.

(6) The term "permanent repository" means any facility for the permanent deep geologic disposal of radioactive waste, spent nuclear fuel, or any combination of such waste or fuel, in a manner which does not permit the subsequent recovery of the materials placed in the repository.

(7) The term "radioactive waste" means high-level nuclear waste and transuranic waste.

(8) The term "research and development repository" means any repository described by section 102.

(9) The term "Secretary" means the Secretary of Energy.

(10) The term "spent nuclear fuel" means fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

(11) The term "State", except as used in section 112 of this Act, means the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Northern

Mariana Islands, the Trust Territory of the Pacific Islands, and any other territory or possession of the United States. For purposes of section 112, such term means only the fifty States of the United States and the District of Columbia.

(12) The term "State review board" means any State review board that meets the requirements of section 106, as so determined by the Secretary.

(13) The term "transuranic waste" means material contaminated with elements which have an atomic number greater than 92, including neptunium, plutonium, americium, and curium, which have a half life greater than five years, and which are in concentrations greater than ten nanocuries per gram or in such other concentrations as the Nuclear Regulatory Commission determines is necessary to protect the public health and safety.

TITLE I—REPOSITORIES FOR RADIOACTIVE WASTE AND SPENT NUCLEAR FUEL

MISSION PLAN FOR RADIOACTIVE WASTE DISPOSAL

SEC. 101. (a) The Secretary shall prepare a comprehensive report, to be known as the mission plan, which shall provide an informational basis sufficient to permit informed decisions to be made with respect to the disposal of spent nuclear fuel and radioactive waste. The mission plan shall include the following elements:

(1) With respect to research and development needs for repository siting and construction, the plan shall include—

(A) an identification of all scientific and technical information that must be available before rational determinations can be made with respect to the siting and construction of research and development repositories, intermediate scale repositories, and permanent repositories; and

(B) an identification of which information referred to under subparagraph (A) is not available because of unresolved scientific or technical questions, a schedule for the research and development programs to be undertaken to provide such information, a description of the research methods to be used in such programs, and an estimate of the costs required to carry out such research and development programs.

(2) An evaluation of financial, political, or institutional problems which might impede the development of a solution to the problem of the disposal of radioactive waste and spent fuel, and recommendations for ways to resolve them.

(3) The determination of the Secretary regarding the need to proceed with unlicensed research and development repositories, intermediate scale repositories, or both, and, in the case that the Secretary has approved development of such facilities—

(A) the reasons that the Secretary considers their development to be appropriate (including the information determined to be necessary under paragraph (1)(B)) which the Secretary seeks to obtain;

(B) the designation of potential sites for such facilities; and

(C) the period of time during which such facilities would operate, the date at which radioactive waste or spent nuclear fuel stored at the facilities would be removed, and the site to which such waste or fuel would be moved.

The mission plan shall also include any comments made by the Nuclear Regulatory Commission with respect to decisions of the Secretary under this paragraph.

(4) A summary of the results of research and development programs conducted for each of the different geologic media under consideration for the siting of repositories, and on the basis of such information a com-

parison of the advantages and disadvantages associated with the use of such media for repository sites.

(5) Development of site selection criteria on which to base recommendations under paragraph (6) of the sites at which site characterization activities should be undertaken.

(6) Recommendations of the sites at which site characterization activities should be undertaken to determine the suitability of the sites for use as intermediate scale or permanent repositories, and a description of such activities, including—

(A) plans for any on-site testing of radioactive or nonradioactive material;

(B) proposed investigation activities to determine the ability of the site to isolate radioactive waste materials and spent nuclear fuel, which may include borings, surface excavations, exploratory shafts, and in-site testing; and

(C) safety precautions to ensure the protection of the public from such activities.

(7) Recommendations for (A) the form in which radioactive waste and spent nuclear fuel should be emplaced in repositories, (B) the packaging for such waste and fuel, and (C) the manner in which such waste and fuel should be transported.

(8) An estimate of (A) the total repository capacity required to safely accommodate the disposal of all radioactive waste and spent nuclear fuel generated through the year 2000 in the event that no commercial reprocessing of spent nuclear fuel occurs, as well as the repository capacity which would be so required if such reprocessing did occur, (B) the number and type of repositories required to be constructed to provide such disposal capacity, and (C) a schedule for the construction of such repositories, and (D) an estimate of the period during which each repository listed in the schedule would be in operation before being filled to its maximum extent.

(9) An estimate of the costs required (A) to construct and operate the repositories anticipated to be needed under paragraph (8) based on each of the assumptions referred to in such paragraph, (B) to construct and operate any research and development repositories or intermediate scale repositories determined to be necessary (other than any such repositories included under subparagraph (A)), and (C) to carry out any other activities under this Act.

(10) The identification of the possible adverse impacts which may arise from the development of research and development, intermediate scale, or

permanent repositories at a site, and the manner in which the Secretary would determine whether to provide for impact aid to a State or locality under section 108 to help alleviate such impacts.

(b)(1) Not later than January 1, 1982, the Secretary shall submit the mission plan to the State Planning Council established under section 112, to the Interagency Review Group established under section 111, and to the Nuclear Regulatory Commission for their comments. The Secretary, after reviewing any comments made by such entities and revising the plan to the extent that the Secretary may consider to be appropriate, shall submit the mission plan to appropriate committees of the Congress by March 1, 1982. The mission plan shall be effective at the end of the first period of sixty calendar days of continuous session of the Congress after the date of transmittal of the plan unless, during such period, either House of the Congress passes a resolution the matter after the resolving clause of which reads as follows: "The   disapproves the mission plan submitted by the Secretary of Energy on   ."; (the first blank space being filled with the designation of the appropriate house of the Congress; the second blank space being filled with the date of the transmittal to the Congress). For purposes of paragraphs (3) through (7) of this subsection, the term "resolution" means a resolution described by this paragraph. Any such resolution shall be accompanied by appropriate committee reports providing, in general terms, the reasons for the disapproval.

(2) Paragraphs (3) through (7) of this subsection are enacted by Congress—

(A) as an exercise of the rulemaking power of the Senate and the House of Representatives, respectively, and as such are deemed a part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in that House in the case of resolutions described by paragraph (1) of this subsection; and the provisions of such paragraphs supersede other rules only to the extent that they are inconsistent therewith; and

(B) with full recognition of the constitutional right of either House to change the rules (so far as relating to the procedure of that House) at any time, in the same manner and to the same extent as in the case of any other rule of the House.

(3) A resolution once introduced with respect to any mission plan shall immediately be referred to a committee (and all resolutions with respect to the same plan shall be referred to the same committee) by the President of the Senate or the Speaker of the House of Representatives, as the case may be.

(4)(A) If the committee to which a resolution with respect to a mission plan has been referred has not reported it at the end of thirty calendar days after its referral, it shall be in order to move either to discharge the committee from further consideration of such resolution or to discharge the committee from further consideration of any other resolution with respect to such plan which has been referred to the committee.

(B) A motion of discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported a resolution with respect to the same site designation) and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(C) If the motion to discharge is agreed to or disagreed to, the motion may not be renewed, nor may another motion to discharge the committee be made with respect to any other resolution with respect to the same site designation.

(5)(A) When the committee has reported, or has been discharged from further consideration of, a resolution it shall be at any time thereafter in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(B) Debate on the resolution referred to in subparagraph (A) of this paragraph shall be limited to not more than five hours, which shall be divided equally between those favoring and those opposing such resolution. A motion further to limit debate shall not be debatable. An amendment to, or motion to recommit, the resolution shall not be in order, and it shall not be in order to move to reconsider the vote by which such resolution was agreed to or disagreed to.

(6)(A) Motions to postpone, made with respect to the discharge from committee, or the consideration of, a resolution, and motions to proceed to the consideration of other business, shall be decided without debate.

(B) Appeals from the decision of the Chair relating to the application of the rules of the Senate or the House of Representatives, as the case may be, to the procedure relating to a resolution shall be decided without debate.

(7) Notwithstanding any of the provisions of this subsection, if a House has approved a resolution with respect to a

mission plan, then it shall not be in order to consider in that House any other resolution with respect to the same plan.

(8) For purposes of this subsection—

(A) continuity of session of Congress is broken only by an adjournment sine die; and

(B) the days on which either House is not in session because of an adjournment of more than three days to a day certain are excluded in the computation of the sixty-day period.

(c)(1) If a mission plan fails to become effective as the result of the disapproval of the Congress under subsection (b), the Secretary shall revise the mission plan to take into consideration the reasons cited by the Congress as the basis for the disapproval, and shall submit to the State Planning Council, the Interagency Review Group, the Nuclear Regulatory Commission, and the Congress, not later than one hundred and eighty days after any disapproval, a revised plan. A revised plan shall become effective (or shall be disapproved) in the same manner as provided under subsection (b) with respect to the original submission.

(2) Every two years after the mission plan first takes effect under this section, the Secretary shall submit to the Congress a report describing in detail the progress made toward implementation of the plan. The report shall include proposals for any revisions or amendments to the mission

plan which the Secretary considers appropriate to accomplish the purposes of this Act.

(3) Any proposed amendment to an approved mission plan shall be submitted to the Congress, either in a report under paragraph (2) or at such other time as the Secretary considers appropriate, and the amendment shall become effective (or shall be disapproved) in the same manner as provided under subsection (b).

RESEARCH AND DEVELOPMENT REPOSITORIES

SEC. 102. (a)(1) If the Secretary concludes in the mission plan that establishment and operation of unlicensed research and development repositories to gather test data regarding the suitability of the emplacement of radioactive waste or spent nuclear fuel in various geologic media, and the interaction of such waste or fuel with such media, is necessary or appropriate, the Secretary may provide for one such repository in each geologic media under consideration for use for permanent repositories. In designating sites for repositories under this section, the Secretary shall give preference to sites on which facilities of the Department of Energy are located. Not more than forty metric tons of spent nuclear fuel may be stored at any research and development repository, and all spent nuclear fuel emplaced in any such repository shall be stored in such manner that the fuel is fully retrievable. Before constructing a research and development repository at any specific site, the Secretary shall consult with the Nuclear Regulatory Commission. The Secretary shall notify the State review board of any State in which the Secretary intends to construct such a facility and shall make a good faith effort to enter into an agreement with such board providing for the terms and conditions of the construction and operation of the facility. If the Secretary and the board are not able to negotiate an agreement within the six-month period beginning on the date of the notification, the Secretary may begin construction activities at the site without reaching an agreement.

(2) At the end of the period provided for the operation of the research and development repository (as specified in the mission plan), the radioactive waste or spent nuclear fuel stored at the site shall be removed for storage to an appropriate location, as identified under the mission plan.

(b) No action taken under the authority of this section shall be considered to be a major Federal action for purposes of the National Environmental Policy Act of 1969. However, before designating any site for a repository under this section and before beginning construction of any repository at a designated site, the Secretary shall review the environmental impacts of the site designation and the proposed repository construction and shall issue a report containing an environmental assessment thereof.

INTERMEDIATE SCALE REPOSITORIES

SEC. 103. (a) In developing the mission plan under section 101, the Secretary shall determine, after consultation with the Nuclear Regulatory Commission, whether or not to proceed with development of intermediate scale repositories for the storage of radioactive waste or spent nuclear fuel, or any combination thereof. The determination shall be based upon an evaluation of the following factors:

(1) The need to acquire more information about the suitability of a waste disposal system, geologic medium, or specific site for the permanent disposal of radioactive waste or spent nuclear fuel, and the extent to which a facility under this section would provide such information.

(2) The need to acquire more expertise regarding any aspect of the construction or operation of a permanent repository, which expertise could be acquired only through the actual construction or operation of an intermediate scale repository.

(b) Any intermediate disposal facility under this title shall be constructed in such manner that—

(1) it has a storage capacity of not less than several hundred, but not more than one thousand, metric tons of spent nuclear fuel;

(2) the spent nuclear fuel emplaced in the repository shall be fully retrievable for a period of twenty years (unless before the end of such period the facility is expanded into a permanent repository); and

(3) the facility can be expanded into a permanent repository subject to licensing for such purpose by the Nuclear Regulatory Commission.

(c) The procedures specified under section 104 relating to (1) review by State review boards or Indian tribal governing bodies, (2) mediation by the Independent Review and Mediation Board, and (3) licensing by the Nuclear Regulatory Commission shall each be applicable to the siting, construction, and operation of repositories under this section.

SITE CHARACTERIZATIONS, REVIEW PROCEDURES, AND CONSTRUCTION AUTHORIZATION

SEC. 104. (a) When the Secretary submits the mission plan to the State Planning Council, Interagency Review Group, and Nuclear Regulatory Commission for review as required under section 101, the Secretary shall also submit a copy of the proposed plan to the State review board of each State in which is located the proposed site of any research and development repository, intermediate scale repository, or permanent repository, and to the tribal governing body of any Indian tribe on whose reservation a proposed site is located. To each such board or governing body, the Secretary shall provide in addition to the mission plan other detailed information relevant to the site involved in order to further elaborate upon the reasons for choosing the site.

(b) Not later than January 1, 1985, the Secretary shall—

(1) complete characterization activities (including the sinking of shafts) at each site designated in the mission plan as the site for an intermediate or permanent repository; and

(2) provide a report containing the results of such characterization activities to each appropriate State review board and Indian tribal governing body.

(c)(1) Not later than January 1, 1987, the Secretary shall designate at least two sites for the construction of intermediate scale or permanent repositories. No site may be designated by the Secretary under this paragraph unless the Secretary has—

(A) completed any environmental impact statement required by law to be prepared for the site;

(B) completed the engineering design plans for the repository proposed for the site and determined the appropriate waste form or forms and packaging technologies; and

(C) submitted a preliminary license application to the Nuclear Regulatory Commission and solicited their comments, based on the information described under subparagraphs (A) and (B) and any other information contained in a preliminary application, on whether the Secretary should proceed with consideration of such site as the site for an intermediate scale or permanent repository.

(2) Not later than January 1, 1991, the Secretary shall designate such additional sites for the construction of repositories as may be required to carry out the mission plan. The procedures under this section shall be applicable to such sites (except that the dates specified in subsections (b) and (c) shall not apply to subsequent designations).

(3) A site designation under this subsection shall take effect thirty days after the date the site designation is made under this subsection except in any case in which objections to the designation are filed under subsection (d). If objections are so filed, a site designation may take effect only when the Independent Review and Arbitration Board determines under subsection (d)(2) that the characterization activities, characterization report, environmental impact statement, engineering design, and designated waste form or forms and packaging technologies for the site are adequate.

(d)(1) Not later than thirty days after the date of the designation of a site for a repository under subsection (c), any State review board or Indian tribal governing body having objections to the designation may submit to the Secretary and to the Independent Review and Arbitration Board written notice that of its objection to the designation, together with detailed reasons for the objection.

(2) The Independent Review and Arbitration Board (hereinafter in this paragraph referred to as the "Board") shall review any objections under paragraph (1) in order to determine (A) whether the site characterization activities at the site were conducted in the manner required under the mission plan, (B) whether the engineering design, designated waste form or forms, packaging technologies, characterization report, and the environmental impact statement for the site fully address those concerns raised by the State review board or tribal governing body which the Board finds to be of significance. Not later than ninety days after its receipt of any objection under paragraph (1), the Board shall make the determinations specified in the preceding sentence and shall issue written notice thereof. If the Board finds that the characterization activities, engineering design, designated waste form or forms and packaging technologies, characterization report, or environmental impact statement are not adequate for any of the reasons specified in the objections filed with the Board under paragraph (1), the Board shall identify those activities that must be undertaken by the Secretary to correct

any deficiencies. Determinations of the Board shall be final and shall not be subject to judicial review.

(e) As soon as possible after the designation of the sites under subsection (c) are effective, the Secretary shall submit to the Nuclear Regulatory Commission an application for a construction license for each designated site. The Nuclear Regulatory Commission shall make its determination to grant or deny any such application not later than four years after the date of its submission.

(f) The Government shall take title to any radioactive waste or spent nuclear fuel which is to be stored at an intermediate scale or permanent repository when such waste or fuel is delivered to such repository for storage. The Government shall not pay for any costs related to the transportation of such waste or fuel to such facility.

INDEPENDENT REVIEW AND ARBITRATION BOARD

SEC. 105. (a) Effective January 1, 1985, there is established a board to be known as the Independent Review and Arbitration Board (hereinafter in this section referred to as the "Board") which shall be responsible for carrying out the duties assigned to it by section 104 and for assisting State review boards and Indian tribal governing bodies in securing such information as they may need in order to assess the activities undertaken, and reports issued, with respect to possible sites in their States or reservations. The Board shall be composed of eleven members, as follows:

(1) Two members of the House of Representatives serving on a committee having jurisdiction over radioactive waste disposal, one of whom shall be appointed by the Speaker of the House and one of whom shall be appointed by the minority leader.

(2) Two members of the Senate serving on a committee having jurisdiction over radioactive waste disposal, one of whom shall be appointed by the Speaker pro tempore of the Senate, and one of whom shall be appointed by the minority leader of the Senate.

(3) Three members appointed by the President, one appointed from among recommendations received by representatives of the nuclear industry, one appointed from among recommendations received from public interest environmental groups, and one appointed from among recommendations received from the scientific community.

(4) Four members appointed by the State Planning Council established under section 112 from each of the geographic regions of the country on the basis of recommendations received by the Governors of the States.

(b)(1) Subject to paragraph (2), members of the Board shall serve for the life of the Board. Any vacancy in the

Board shall be filled in the manner in which the original appointment was made.

(2) If any member of the Board who was appointed to the Board as a Member of the Congress leaves that office, such member may continue as a member of the Board for not longer than the thirty-day period beginning on the date the member leaves such office.

(3) Members of the Board shall serve without pay, except that while away from their homes or regular place of business in the performance of services for the Board, all members shall be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in the Government service are allowed under 5703 of title 5, United States Code.

(c)(1) The Chairman of the Board shall be elected by the members of the Board. The term of office of the Chairman shall be four years.

(2) The Board shall meet not less than once every two months at the call of the Chairman or a majority of its members.

(d)(1) The Board may appoint and fix the pay of such staff as the Board considers appropriate. The staff may be appointed without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and may be paid without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and General Schedule pay rates, except that no individual so appointed may receive pay in excess of the maximum annual rate of basic pay payable for grade GS-16 of the General Schedule.

(2) The Board may procure temporary and intermittent services under section 3109(b) of title 5, United States Code, but at rates for individuals not to exceed the maximum annual rate of basic pay payable for grade GS-16 of the General Schedule.

(3) Upon request of the Board, the head of any Federal agency may detail, on a reimbursable basis, any of its personnel to the Board to assist the Board in carrying out its duties under this section.

(4) The Administrator of General Services shall provide to the Board on a reimbursable basis such administrative support services as the Board may request.

(e)(1) The Board may, for the purpose of carrying out this section, hold such hearings, sit and act at such times and places, take such testimony, and receive such evidence, as the Board considers appropriate. The Board may administer oaths or affirmations to witnesses appearing before it.

(2) Any member or agent of the Board may, if so authorized by the Board, take any action which the Board is authorized to take by this section.

(3) The Board may secure directly from any department or agency of the United States information necessary to enable it to carry out its duties. Upon request of the Chairman of the Board, the head of such department or agency shall furnish such information to the Board.

(4) The Board may use the United States mails in the same manner and under the same conditions as other departments and agencies of the United States.

(f)(1) The Board may issue subpenas requiring the attendance and testimony of witnesses and the production of any evidence that relates to any matter under investigation by the Board. Such attendance of witnesses and the production of such evidence may be required from any place within the United States at any designated place of hearing within the United States.

(2) If a person issued a subpena under paragraph (1) refuses to obey such subpena or is guilty of contumacy, any court of the United States within the judicial district within which the hearing is conducted or within the judicial district within which such person is found or resides or transacts business may (upon application by the Board) order such person to appear before the Board to produce evidence or to give testimony relating to the matter under investigation. Any failure to obey such order of the court may be punished by such court as a contempt thereof.

(3) The subpenas of the Board shall be served in the manner provided for subpenas issued by a United States district court under the Federal Rules of Civil Procedure for the United States district courts.

(4) All process of any court to which application may be made under this section may be served in the judicial district in which the person required to be served resides or may be found.

(5) No person shall be excused from attending and testifying or from producing books, records, correspondence, documents, or other evidence in obedience to a subpena, on the ground that the testimony or evidence required of him may tend to incriminate him or subject him to a penalty or forfeiture; but no individual shall be prosecuted or subjected to any penalty or forfeiture by reason of any transaction, matter, or thing concerning which he is compelled, after having claimed his privilege against self-incrimination, to testify or produce evidence, except that such individual so testifying shall not be exempt from prosecution and punishment for perjury committed in so testifying.

(g) The Board shall cease to exist thirty days after it has carried out all its duties under this section with respect to the last site designated for a repository by the Secretary pursuant to the mission plan.

ROLE OF STATE REVIEW BOARDS AND INDIAN TRIBES

SEC. 106. (a)(1) For purposes of this title, a State review board of a State is an entity of the State which is—

(A) created under State law with the authority described in paragraph (2) and the composition prescribed by paragraph (3); and

(B) determined by the Secretary to be established in accordance with this section.

(2) A State review board shall be authorized under State law to—

(A) review activities under this title and activities of the Nuclear Regulatory Commission with respect to any site in the State designated under the mission plan for site characterization activities in order to determine the potential impacts of any intermediate scale or permanent repository on the State and its residents;

(B) be a representative of the State in any proceeding before the Nuclear Regulatory Commission respecting a site for such a repository in the State; and

(C) submit, in accordance with section 104(d), to the Independent Review and Arbitration Board objections regarding the designation of a site in the State for such a repository.

(3) The State review board shall consist of representatives of local governments which would be affected by the

repository and members representing the interests of the general public in the State.

(4) The State review board shall hold meetings open for public participation not less than once every four months, at which meetings the board shall receive and to the extent practicable place on its agenda matters submitted by board members.

(5) The authority of State review boards shall not be applicable with respect to sites located on Indian reservations. Any references contained in this section to sites located within a State shall not be deemed to include sites located on Indian reservations within the State.

(b) Subject to subsection (d) and to the availability of funds to carry out this subsection, the Secretary shall make grants to the State review boards of each State in which a site for a repository has been designated under the mission plan. Grants under this subsection shall be made under such terms and conditions as the Secretary may prescribe.

(c) The governing body of any Indian tribe on whose reservation is located a site designated for site characterization under the mission plan shall have the authorities described under subsections (a)(2)(A) and (a)(2)(C). Subject to the availability of funds to carry out this section, the Secretary shall provide to the governing body of each Indian tribe referred to in the preceding sentence such funds as may be necessary to provide technical assistance to the tribe, and to assist the tribe in conducting the activities described under subsections (a)(2)(A) and (a)(2)(C) as well as similar activities related to a repository.

(d)(1) State review boards or governing bodies of Indian tribes, as the case may be, may not receive grants under this section after the expiration of one year after—

(A) the date on which the Secretary notifies the State review board or tribal governing body that, on the basis of site characterization activities, the Secretary has determined that a site in the State or on the reservation of the tribe, as the case may be, does not meet the requirements applicable to repositories; or

(B) the date on which the Commission disapproves an application for a construction authorization for a repository at a site in the State or on the reservation of the tribe;

unless there is another site in the State or on the reservation of the tribe, as designated in the mission plan, with respect to which the actions described in subparagraphs (A) and (B) have not been taken.

(2) At the end of the one-year period beginning on the effective date of any operating license for a repository in a State or on the reservation of an Indian tribe, no Federal funds shall be made available under this subsection for the

State review board of the State in which the repository is located or for the governing body of the affected Indian tribe, except for--

(A) such funds as may be necessary to support activities related to any other repository located in, or proposed to be located in, such State or reservation, and for which an operating license has not been in effect for more than one year; and

(B) such funds as may be necessary to support activities pursuant to agreements or contracts for assistance entered into under subsection (c) or (d) with the Secretary before the end of such one-year period.

FEDERAL COOPERATION WITH STATES AND INDIAN TRIBES

SEC. 107. (a) The Secretary, the Nuclear Regulatory Commission, and other agencies involved in the construction or operation of any research and development, intermediate scale, or permanent repository in a State shall provide to the State review board of such State, and to the governing body of any Indian tribe on or adjacent to whose reservation the repository site is located, timely and complete information regarding determinations or plans made with respect to the siting, development, design, construction, operation, or regulation of the repository.

(b) In performing any study of an area within a State for the purpose of determining the suitability of the area for a repository and in subsequently developing and loading radioactive materials at any repository within a State, the Secretary shall consult and cooperate with the State review board of the State and the governing body of any affected Indian tribe in an effort to resolve the concerns of the State and any affected Indian tribe regarding the public health and safety, environmental, and economic impacts of any such repository. In carrying out his duties under this Act, the Secretary shall take such concerns into account to the maximum extent feasible.

(c) As soon as possible after notifying a State review board or Indian tribe of his decision to study an area within such State as a possible repository site, the Secretary shall seek to enter into a written agreement with the State review board of the State and, where appropriate, a separate agreement with the governing body of any affected Indian tribe, setting forth the procedures under which the requirements of this section shall be carried out. The written agreement shall specify procedures—

(1) by which the State review board or the governing body of the Indian tribe (as the case may be) may study, determine, comment on, and make recommendations with regard to the possible health and

safety, environmental, and economic impacts of any such repository;

(2) by which the Secretary may consider and respond to comments and recommendations made by the State review board or the governing body of the Indian tribe (as the case may be), including the period in which the Secretary may so respond;

(3) by which the Secretary and either the State review board or the governing body of the affected Indian tribe (as the case may be) may review or modify the agreement periodically; and

(4) for public notification of the procedures specified under paragraphs (1) through (3).

PAYMENTS TO STATES

SEC. 108. (a) Notwithstanding any other provision of law, from funds available under section 109 the Secretary shall make annual payments in lieu of taxes to the States for any property within their jurisdiction owned by the Federal Government and used for a research and development repository, intermediate scale repository, or permanent repository. The payments shall be in amounts determined by the Secretary to be the amount of taxes that would be levied against the property if the property were subject to property taxation by the State. Property shall be considered to be "used for" a repository within the meaning of this subsection beginning on the date that site characterization activities are commenced at the property. If the Secretary determines at any date after carrying out site characterization activities not to construct a repository on the property, payments made with respect to such property under this subsection shall reflect only those taxes which would have been levied against the property during the period in which characterization activities occurred.

(b) Not later than March 1 of each year, the Secretary shall complete an assessment of the economic, social, environmental, or other impacts to the States or their political subdivisions caused by the siting within the States of research and development, intermediate scale, or permanent repositories. The Secretary shall determine, on the basis of the assessment, whether the payment of any sums in addition to the sums under subsection (a) is appropriate, and shall provide for any such impact aid payments to be made to the appropriate governmental entities from funds available for use for such purpose in the revolving fund established under section 109. In the case of a repository located on an Indian reservation, payments under this section shall be made to the governing body of the affected Indian tribe to the extent considered appropriate by the Secretary.

REPOSITORY TRUST FUND; UTILITY FEES

SEC. 109. (a) There is established in the Treasury a fund which shall be available to the Secretary without fiscal year limitation, in such amounts as may be specified from time to time in appropriation Acts—

(1) to enable the Secretary to carry out site characterization activities at potential sites for intermediate scale or permanent repositories, and to construct and operate such repositories, pursuant to the mission plan; and

(2) to permit the Secretary to make payments determined to be appropriate under section 108.

There shall be deposited in the fund amounts received by the Secretary under subsection (b), and there are authorized to be appropriated from time to time such additional amounts as may be necessary to provide the sums required for the fund. Money in the fund shall not be used to carry out research and development activities in connection with the mission plan.

(b) The Secretary shall determine, based upon cost estimates contained in the mission plan, the total anticipated cost of carrying out the activities specified in paragraphs (1) and (2) of subsection (a), other than any costs required for the disposal of radioactive waste or spent nuclear fuel owned by the Federal Government, any State, or any other public entity. The Secretary shall then calculate, for each metric ton of spent nuclear fuel or radioactive waste which is privately owned, the disposal fee to be assessed to persons or entities who hold title to such waste or fuel. The owners of radioactive waste and spent nuclear fuel shall be required to pay to the Secretary, in a lump sum, an amount sufficient to cover their disposal costs (as determined under the preceding sentence) based upon the amount of radioactive waste and spent nuclear fuel in interim storage to which they hold title. The Secretary shall collect the initial fees as soon as possible after determining the per unit costs to be assessed under this subsection, and shall from time to time assess and collect additional fees for radioactive waste or spent nuclear fuel subsequently discharged from nuclear reactors, or otherwise generated, and placed in interim storage. When radioactive waste or spent nuclear fuel is delivered for disposal to an intermediate scale or permanent repository constructed under this title, the Secretary shall determine the actual costs required to construct the repository and shall review the fees charged under this subsection to determine whether they accurately reflect such costs. Based on such calculations, the Secretary may revise the fees charged and may provide for a surcharge or a rebate of fees to the extent appropriate.

SCHEDULE FOR CERTAIN STANDARDS AND CRITERIA

SEC. 110. (a) Not later than October 1, 1981, the Administrator of the Environmental Protection Agency, pursuant to authority under other provisions of law, shall by rule promulgate generally applicable standards for the protection of the general environment from radioactive material in repositories.

(b) Not later than October 1, 1981, the Nuclear Regulatory Commisison, pursuant to authority under other provisions of law, shall by rule promulgate criteria which it will apply in reviewing under the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974 applications for construction authorizations for the construction of intermediate scale and permanent repositories.

INTERAGENCY REVIEW GROUP

SEC. 111. (a)(1) There is established the Interagency Review Group (hereinafter in this section referred to as the "group") which shall be composed of nine members. The heads of the following agencies shall each appoint one employee to serve as a member of the group: the Department of Energy; the Environmental Protection Agency; the Department of Transportation; the Nuclear Regulatory Commission; the Office of Management and Budget; the Department of the Interior; the Department of Commerce; and the Council for Environmental Quality. The President shall also appoint one individual on his personal staff responsible for domestic policy and science matters to serve as a member of the group.

(2) Members shall serve for the life of the group. Any vacancy in the group shall be filled in the manner in which the original appointment was made. If any member who was appointed as the representative of an agency under paragraph (1) ceases to be an employee of such agency, the member may continue as a member of the group for not longer than the thirty-day period beginning on the date such employment terminates.

(3) Members of the group shall serve without pay.

(4) The Chairman of the group shall be elected by its members.

(5) The group shall meet not less than twice each month at the call of the Chairman or a majority of its members.

(b) The group shall be responsible for—

(1) developing ways in which to improve interagency coordination of policies with respect to radioactive waste management;

(2) assisting the Secretary to develop the mission plan as required under this title; and

(3) reviewing the mission plan and submitting written comments on such plan to the Congress not later than March 1, 1982.

In carrying out its functions, the group shall consult on a regular basis with the State Planning Council.

(c)(1) Upon request of the group, the head of any Federal agency is authorized to detail any of its personnel to the group to assist the group in carrying out its duties.

(2) The group may secure directly from any agency of the United States information necessary to enable it to carry out its duties. Upon request of the chairman of the group, the head of such agency shall provide the group with such information.

(3) The group may use the United States mails in the same manner and under the same conditions as other departments and agencies of the United States.

(4) The Administrator of General Services shall provide to the group on a reimbursable basis such administrative support services as the group may request.

(d) The group shall cease to exist sixty days after the submission to the Congress of its comments pertaining to the mission plan, as required under subsection (b).

STATE PLANNING COUNCIL ON RADIOACTIVE WASTE MANAGEMENT

SEC. 112. (a)(1) There is established the State Planning Council on Radioactive Waste Management (hereinafter in this section referred to as the "Council"). The Council shall be composed of eighteen members as follows:

(A) Fourteen members designated by the President, of whom—

(i) eight members shall be Governors of States;

(ii) five members shall be elected officials of State or local governments, other than Governors; and

(iii) one member shall be a representative of an Indian tribal governing body.

(B) The Secretary of the Interior, or his designate.

(C) The Secretary of Transportation, or his designate.

(D) The Secretary of Energy, or his designate.

(E) The Administrator of the Environmental Protection Agency, or his designate.

(2) The Chairman of the Nuclear Regulatory Commission may participate in the activities of the Council, as may representatives of other Federal departments or agencies and representatives of any other entity referred to in section 3(11) when matters affecting them are considered. Individuals permitted to participate in Council activities under this subsection shall not be considered to be members of the Council and shall not be entitled to vote in Council deliberations.

(3) The President shall designate a Chairman from among the members of the Council.

(b) The Council shall provide advice and recommendations to the Secretary and to other Federal agencies on radioactive waste management, and shall review the mission plan submitted to the Council as required under section 101(b). The Council shall also do the following:

(1) Review the development of the mission plan and provide recommendations to ensure that the plans adequately addresses the needs of the State and local areas affected.

(2) Provide advice on all aspects of siting facilities for storage and disposal of radioactive waste and spent nuclear fuel, including the review of recommended criteria for site selection and site suitability, guidelines for regional siting, and procedures for site characterization and selection.

(3) Provide advice on appropriate roles for State governments, local governments, State review boards and Indian tribal governing bodies in the development of research and development repositories and in the licensing process for intermediate scale and permanent repositories.

(4) Provide advice on proposed Federal regulations, standards, and criteria related to radioactive waste management programs.

(5) Identify and make recommendations on other matters related to the transportation, storage, and disposal of radioactive waste and spent fuel that the Council believes are important.

Not later than February 1 of each year, the Council shall prepare and submit to the Secretary and to appropriate authorizing committees of the Congress a report on its activities.

(c) Members of the Council shall serve without pay, except that while away from their homes or regular place of business in the performance of services for the Council, all members shall be allowed travel expenses, including per diem in lieu of subsistence, in the same manner as persons employed intermittently in the Government service are allowed under 5703 of title 5, United States Code.

(d) To the extent permitted by law, and subject to the availability of funds, the Secretary of Energy shall provide the Council, including any subcommittees, with necessary facilities, support, and services, including staff and an executive director.

TITLE II—Spent Fuel Policies

INTERIM STORAGE POLICY STATEMENT

Sec. 201. It shall be the policy of the Federal Government that—

(1) the primary responsibility for the interim storage of spent nuclear fuel rests with the private sector; and

(2) title to spent nuclear fuel generated by the private sector may pass to the Federal Government only upon the delivery of such fuel for storage at an intermediate or permanent repository constructed under title I of this Act.

REPROCESSING OF SPENT NUCLEAR FUEL

SEC. 202. (a)(1) The Nuclear Regulatory Commission shall continue to develop the necessary procedures, as required under the Atomic Energy Act of 1954 or other applicable law, to proceed with the licensing of commercial nuclear reprocessing operations, and shall seek to complete such procedures as soon as possible. After developing necessary licensing procedures the Nuclear Regulatory Commission shall permit the commercial reprocessing of spent nuclear fuel, subject to such permits, licenses, or other requirements the Commission may impose under the Atomic Energy Act of 1954 or other applicable law.

(2) The Federal Government shall not subsidize the commercial reprocessing of spent nuclear fuel and shall not undertake Federal reprocessing for commercial purposes.

(3) It shall be the policy of the Federal Government to continue with research and development projects relating to

commercial reprocessing of spent nuclear fuel and with the development of reprocessing technologies that will not result in nuclear proliferation.

DRY STORAGE FOR SPENT NUCLEAR FUEL

SEC. 202. (a) In order to carry out the policy of the Government for minimizing the transportation of spent nuclear fuel, the Secretary is authorized to carry out a demonstration program, in cooperation with the private sector, for the dry storage of spent nuclear fuel at sites adjacent to nuclear powerplants. Within one year after the date of the enactment of this Act, the Secretary shall select several sites at nuclear powerplants which are suitable for the demonstration program. In selecting the sites, the Secretary shall give preference to utilities which will soon have a shortage of interim storage capacity for spent nuclear fuel. Subject to the agreement of the affected utilities, the Secretary shall undertake at least one demonstration project for each of the following types of storage: canyon, caisson, and cask. If a utility which owns a site selected for the program wishes to participate, the utility shall enter into an agreement with the Secretary under which—

(1) the utility agrees to make the land available for the dry storage facility, to operate the facility after it is licensed, and to pay all costs associated with the operation of the facility; and

(2) the Secretary agrees to—

(A) provide such technical assistance as the utility may request in order to obtain construction and operating licenses from the Nuclear Regulatory Commission;

(B) pay for 75 per centum of the costs required to design and construct the dry storage facility.

IMPROVEMENTS IN LICENSING OF SPENT NUCLEAR FUEL STORAGE FACILITIES

SEC. 203. The Nuclear Regulatory Commission shall review its procedures relating to the licensing of facilities for the storage of spent nuclear fuel in pools, and shall consider ways in which the time required for the licensing processing could be shortened. Not later than six months after the date of the enactment of this Act, the Commission shall submit a report to the Congress containing its findings and recommendations.

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BOUQUARD/LUJAN PROPOSAL

[DISCUSSION DRAFT]
SEPTEMBER 29, 1981

97TH CONGRESS
1ST SESSION

H. R. ______

IN THE HOUSE OF REPRESENTATIVES

________________ introduced the following bill; which was referred to the Committee on ____________

A BILL

To establish a Federal policy with respect to the disposal of high-level radioactive waste from civilian nuclear activities, to provide for the construction, operation, and maintenance of waste disposal facilities, to provide for a program of nuclear waste and spent fuel research and development, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the ''High-Level Radioactive Waste Management and Policy Act''.

DEFINITIONS

SEC. 2. For purposes of this Act:

(1) The term ''agency'' or ''Government agency'' means any part of the executive branch of the United States, or any commission, branch, department, or bureau of the United States uncluding, but not limited to, the Nuclear Regulatory Commission, the Environmental Protection Agency, and the Department of the Interior.

(2) The term ''atomic energy defense activities of the Secretary'' includes those activities performed, in whole or in part, in carrying out the functions of--

(A) naval reactors development and propulsion,

(B) weapons activities, verification, and control technology,

(C) defense materials production,

(D) inertial confinement fusion,

(E) defense waste management, and

(F) defense nuclear materials, security, and safeguards,

all as included in the appropriations account of the Department in any fiscal year for such functions.

(3) The term ''Commission'' means the Nuclear

Regulatory Commission.

(4) The term ''Department'' means the Department of Energy.

(5) The term ''disposal'' means the emplacement of radioactive waste with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste.

(6) The term ''engineered barriers'' means man-made components of the disposal system designed to prevent the release of radionuclides into the geologic media, and includes, among other things, the waste form, the waste canisters, and other materials to be placed over and around the waste canisters.

(7) The term ''environmental impact statement'' means any document prepared in accordance with section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)).

(8) The term ''Governor'' means the Governor of a State.

(9) The term ''high-level radioative waste'' or ''waste'' means highly radioactive materials resulting from the reprocessing of spent fuel, including liquid waste produced directly in such reprocessing or any solid material into which such liquid waste is converted, materials resulting from other recovery or

clean-up operations involving irradiated fuels which contain fission products, spent fuels designated by the Secretry to be unsuitable for technical reasons for reprocessing, certain non-fuel materials activated by neutron bombardment as may be designated by the Secretary or the Commission, and such other highly radioactive material as the Secretary or the Commission shall designate as high-level radioactive waste following a determination that such designation is necessary to protect the public health and safety.

(10) The term ''Indian tribe'' means an Indian tribe, as defined in section 4(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 540b(b)).

(11) The term ''nuclear waste repository'' or ''repository'' means (except as provided in section 4 of this Act) any facility for the disposal of the solid forms of transuranic waste, high-level radioactive waste, spent fuel, or any combination of such materials, whether or not such facility is designated to permit the subsequent recovery of the materials placed in the repository.

(12) The term ''Secretary'' means the Secretary of Energy.

(13) The term ''site characterization'' means

activities including borings, surface excavations, shaft excavations, subsurface lateral excavations and borings, and in site testing to determine the suitability of a site for a test and evaluation facility or a repository or both, but does not include preliminary borings and geophysical testing needed to decide whether site characterization should be undertaken.

(14) The term ''solidified waste'' means radioactive waste which hs ben processed to produce a solid waste form that meets the requirements for transportation and permanent disposal promulgated pursuant to this Act or other Acts of Congress.

(15) The term ''spent fuel'' means nuclear fuel that has been irradiated in, and recovered from, a civilian nuclear powerplant and which has not undergone reprocessing to separate constituent elements.

(16) The term ''State'' means any State of the United States, the District of Columbia, and, subject to the provisions of the Act of March 12, 1980 (94 Stat. 84), the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Norther Mariana Islands, the Trust Territory of the Pacific Islands, and any other territory or possession of the United States.

(17) The term ''Test and Evaluation Facility'' or ''demonstration facility'' means an at-depth,

prototypic, limited-capacity underground cavity with subsurface lateral excavations, extending from a central shaft, which is used for research and development purposes, including the development of data, and experience for the safe handling and disposal of solidified waste.

(18) The term ''transuranic waste'' means material containing elements having an atomic number greater than 92, including neptunium, plutonium, americium, and curium, in concentrations of greater than 10 nanocuries per gram.

(19) The term ''tribal council'' means the governing body of an Indian tribe or tribes.

(20) The term ''waste package'' or ''package'' means the primary container which holds and is in contact with solidified waste and any overpacks which are made integral with the primary container, but does not inlcude other elements of the engineered barriers which are emplaced at the geologic repository.

FINDINGS AND PURPOSES

SEC. 3. (a) FINDINGS.--The Congress finds that--

(1) spent fuel from nuclear power reactors and wastes from the commercial industry are accumulating rapidly and may create a national problem;

(2) State and public participation in the planning

and development of repositories for the disposal of radioactive waste is essential in order to promote public confidence in methods for the safe disposal of radioactive waste;

(3) the technology exists to provide reasonable assurance that high-level radioactive waste can be safely disposed of and that disposal facilities for high-level wastes can be made available when needed; and

(4) it is in the national interest to resolve issues relating to the nuclear fuel cycle because--

(A) a reliable system adequate to provide sufficient electrical energy to meet the Nation's current and anticipated needs is an essential part of both interstate commerce and comprehensive national energy policy and is vital to the national security and public welfare;

(B) an adequate electrical system requires a diversified base of primary energy sources in order to avoid excessive reliance upon any single alternative energy source;

(C) a diverse base of primary energy sources can be achieved only if each available source competes on an equal footing in decisions on the siting and construction of facilities for generating commercial electric power; and

(D) nuclear energy can help reduce United States dependence on insecure sources of foreign oil.

(b) PURPOSE.--It is the purpose of this Act--

(1) to establish the Federal policy and the responsibilities for the disposal of high-level radioactive waste from civilian nuclear activities;

(2) to accelerate and provide direction to the Secretary in regard to the disposal of waste;

(3) to authorize the Secretary--

(A) to provide for the construction, operation, and maintenance of waste disposal facilities; and

(B) to provide for a focused and integrated nuclear waste and spent fuel research and development program, including the development of a Test and Evaluation Facility to carry out research and provide an integrated demonstration of the technology for disposal of waste, and including the development of the facilities to demonstrate dry storage of spent fuel;

(4) to provide the Secretary with contracting authority to collect, in advance, from the users of nuclear technology, the costs of carrying out these activities;

(5) to provide for an improved cooperative role between the Federal Government and States and Indian

tribes in the siting of facilities for the disposal of waste; and

(6) to provide technical and financial assistance to States and Indian tribes to foster the development and implementation of programs to prevent and mitigate any adverse economic, social, or environmental impacts resulting from construction and operation of repositories.

APPLICATION

SEC. 4. The provisions of this Act shall not apply to the siting, construction, or operation of repositories which are used exclusively for the disposal of high-level radioactive waste, transuranic waste, low-level radioactive waste, or spent fuel resulting from the atomic energy defense activities of the Secretary.

IDENTIFICATION OF SITES FOR WASTE REPOSITORIES

SEC. 5. (a) GUIDELINES.--Not later than 6 months after the date of the enactment of this Act, the Secretary shall, in consultation with the Commission, the United States Geological Survey, and such other Government agencies or departments as the Secretary considers appropriate, issue general guidelines for the selection of sites for repositories. Under such guidelines the Secretary shall specify factors that would qualify a site for development as a repository, including factors pertaining to the location of valuable natural resources, proximity to populations, hydrogeophysics, seismic activity, and nuclear defense activities. The guidelines shall require the Secretary to consider the various geologic media in which sites for repositories may be located and, to the extent practicable, to identify sites in different geologic media. The Secretary shall use guidelines established under this subsection in considering sites to be selected under section 7.

(b) SITE IDENTIFICATION BY THE SECRETARY.--Not later than one year after the date of the enactment of this Act, the Secretary shall identify at least three sites, two of which shall be in different geologic media in the continental United States. Each site identified shall be supported by a detailed statement of the basis for the identification. When the Secretary identifies a site, the Secretary shall as soon as possible notify the Governor of the State in which the site is located and the tribal council of any Indian tribe on whose land the site is located, of the Secretary's identification and the basis for such identification. Additional sites may be identified after the one year period as the Secretary deems necessary.

SITE CHARACTERIZATION

SEC. 6. (a) IN GENERAL.-- Within 3 years after the date on which the Site Identification Report is submitted pursuant to subsection (b), the Secretary shall have completed in accordance with this section appropriate site characterization activities at no fewer than three such sites: Provided, That three sites shall be sufficiently characterized, within 2 years after the date on which the sites are identified, to permit the Secretary to choose a site pursuant to section 7 for the Test and Evaluation Facility.

(b) REVIEWS.--Within six months after identifying the sites pursuant to section 5(b) and before beginning site characterization activities at a site, the Secretary shall submit a Site Identification Report to the Congress, to the Commission, to the Governor of the State in which the site is located, and to the tribal council of any Indian tribe on whose land the site is located, for their review and comment. Such report shall include--

(1) an environmental assessment of the nonradiological impacts of the site characterization activities planned for such site and a discussion of alternative activities for purposes of site characterization which may be undertaken to avoid such impacts;

(2) a general plan for site characterization activities to be conducted at such site, which plan shall include--

(A) a description of the site;

(B) a description of the site characterization activities, including the extent of planned excavations, plans for onsite testing of radioactive or nonradioactive material, plans for any investigation activities which may affect the ability of the site to isolate radioactive wastes or spent fuel, and plans to control likely adverse, safety-related impacts from site characterization activities;

(C) plans for the decontaminating and decommissioning of the site if it is determined unsuitable for application for licensing as a respository;

(D) the Project Decision Schedule to be prepared pursuant to section 8(e); and

(E) any other related information reasonably requested by the Governor or tribal council; and

(3) the report on waste solidification and packaging as required under section 12(a).

(c) TESTS.--In addition to the research, development, and demonstration program to be conducted at one site in accordance with section 10, the Secretary shall conduct such tests and other research activities as the Secretary considers necessary to provide the data required for an application to be submitted to the Commission pursuant to section 7(b) and necessary to comply with the National Environmental Policy Act of 1969.

(d) RESTRICTIONS.--In conducting site characterization activities or tests for the repository pursuant to subsection (c)--

(1) the Secretary shall use the smallest quantity of waste or other radioactive materials, if any, necessary to achieve the test or research objectives, as provided for under section 10 for the Test and Evaluation Facility;

(2) any radioactive material used or placed on a site shall be fully retrievable; and

(3) upon termination of site characterization activities at a site for any reason, the Secretary shall remove any radioactive material at or in the site as promptly as practicable.

REPOSITORY SITE SELECTION

SEC. 7. (a) HEARINGS AND SECRETARIAL DECISIONS.--(1) Before selecting a site for a repository and within 3 months after completion of the site characterization, the Secretary shall hold at least one public hearing (in accordance with section 553 of title 5, United States Code) in the vicinity of the site to inform the residents of the area in which the site is located of the preliminary determination of the

Secretary and to receive their comments. Upon completion of the hearing process, if the Secretary determines to select that site for a repository, the Secretary shall immediately notify the Governor of the State in which such proposed repository would be located or the appropriate tribal council (or both) of his decision, and a Repository Development Report as required under section 8(b) shall be submitted to Congress by the President.

(2) If the Secretary's selection of a site for the initial repository does not take effect because of disapproval by the President or the Congress under section 8, the President shall submit to the Congress within 12 months after such disapproval a Repository Development Report for another site as selected by the Secretary for an initial repository.

(b) SUBMISSION OF APPLICATION.--(1) If the Secretary's selection of a site for a repository is not disapproved by the President or the Congress under section 8, the Secretary shall--

(A) submit to the Commission, within 30 days after the date on which the selection of the site becomes effective under section 8, a license application for the construction and operation of a repository at such site; and

(B) provide the Governor of the State in which the site is located, and the tribal council of any Indian tribe on whose land the site is located, a copy of the application.

(2) The Commission shall consider the application only on the basis of protecting the public health and safety, including but not limited to that part of the application dealing with alternative sites.

(c) LICENSING STATUS REPORT.--No later than 24 months after the date on which an application for a license is submitted under subsection (b), and annually thereafter, the Commission shall submit a report to the Congress describing the proceedings undertaken through such date with regard to such application, including a description of--

(1) major unresolved safety issues and the Secretary's explanation of design and operation plans for resolving such issues;

(2) matters of contention regarding the application; and

(3) any Commission actions regarding approval or disapproval of the application or the operating license.

(d) REPOSITORY LICENSING AND CONSTRUCTION.--(1) The Commission shall consider a license application for the construction and operation of all or part of a repository in accordance with this Act and all other laws applicable to such applications, except that the Commission shall make a final decision approving or disapproving the issuance of construction authorization not later than 24 months after the date of the submission of the application. Prior to receiving the license application, the Commission shall, to the maximum extent practical, keep itself fully and currently informed about the activities of the Department that are pertinent to the licensing process and conduct any activities that may help the Commission to minimize the time needed to consider the potential application.

(2) Notwithstanding any other provision of law to the contrary, in any Commission hearing pursuant to the Atomic Energy Act of 1954 on an application for a license to construct and operate a repository (or any amendment to such a license), the Commission shall first provide the parties to the proceeding with an opportunity to submit for the record such written data, views, or arguments as the hearing board may specify. At the request of any party, the hearing board shall provide an opportunity for oral argument with respect to any matter identified in the written submissions which the hearing board determines to be in controversy among the parties. The hearing shall be preceded by such discovery procedures as the rules of the Commission shall provide, and as ordered by the hearing board. The hearing board shall require each moving party, including the Commission staff, to submit in written form, at the time the

proceeding is initiated, all the facts and arguments upon which that party proposes to rely that are known at such time to that party.

(3)(A) At the conclusion of any hearing under paragraph (2), the hearing board shall designate any disputed question of fact, together with any remaining questions of law, for resolution in an adjudicatory hearing only if it determines that--

(i) there is a genuine and substantial dispute of fact involving factual assumptions or methodology upon which expert opinion is based, or concerning the credibility or competence of an expert witness significantly relied upon by one or more of the parties to the proceeding, which can only be resolved with sufficient accuracy by the introduction of reliable and sepcifically identified evidence in an adjudicatory hearing;

(ii) such dispute directly involves a technical matter affecting the safe construction or operation of the facility which is the subject of the hearing; and

(iii) the decision of the Commission is likely to depend in whole or in part on the resolution of such dispute.

(B) In making a determination under this paragraph, the hearing board shall designate in writing the specific facts that are in genuine and substantial dispute, the reason why the decision of the agency is likely to depend on the resolution of such facts, and the reason why an adjudicatory hearing is likely to resolve the dispute.

(4) No court shall hold unlawful or set aside a decision of the Commission in any proceeding described in paragraph (2) because of a failure by it to use a particular procedure pursuant to this section unless--

(A) an objection to the procedure used was presented to the hearing board in a timely fashion or there are extraordinary circumstances that excuse the failure to present a timely objection, and

(B) the court finds that such failure has precluded a fair consideration and informed resolution of a central issue of the proceeding taken as a whole.

(5) No member of a hearing board in a proceeding pursuant to this subsection may raise for consideration in such hearing an issue not put in contention by a party to the hearing, except that the Commission, on its own motion, may direct the hearing board to raise in such hearing any matter, whether or not put in contention by any party, whose resolution it believes may be essential, to the hearing board's decision in the proceeding.

(6) In any Commission hearing on such an application, the Commission shall not admit or consider any contentions

by any party (with the exception of the Governor of the State in which the repository site is located) in public proceedings unless the party offering the contention supports it with a prima facie evidentiary showing of substantial and specific facts, not in the nature of conclusionary allegations, supported by affidavits of persons having personal knowledge of the facts therein.

(7) Within 8 years after the date on which the Secretary submitted the license application to the Commission pursuant to subsection (b)--

(A) the Secretary shall complete construction of surface facilities and such subsurface excavations and facilities as are needed to initiate emplacement of wastes;

(B) the Secretary shall operate the repository at the earliest practical date after receiving a license from the Commission, and may take title in the name of the Government to the waste, spent fuel, or other radioactive material emplaced in the repository; and

(C) the Commission shall issue to the Secretary a partial or full license to operate the repository under such terms and conditions as may be specified by the Commission to protect the public health and safety. Any hearings held pursuant to the Atomic Energy Act of 1954 prior to the issuance of a license to operate the repository shall be limited to health and safety issues not decided at the construction authorization stage.

(8) Notwithstanding section 557(d) of title 5, United States Code, or any other provision of law relating to ex parte communications, the Secretary and any officer or employee of a Government agency to which this Act applies may provide information to the Commission and consult with the Commission at any time and in any manner requested by the Commission.

(9) The Commission shall consider a license application for a repository in accordance with the laws applicable to such applications, except as otherwise provided in this Act and except that--

(A) the promulgation of a rule which takes effect under section ____ shall be treated as the final disposition by the Commission of the issues resolved by such rule and no such issue may be considered by the Commission in the license proceeding; and

(B) the environmental impact statement prepared by the Secretary and submitted to the President, pursuant to this Act, with respect to the site for any repository shall be deemed to also satisfy the Commission's responsibilities under the National Environmental Policy Act of 1969 with respect to that repository.

(10)(A) Any time after filing an application with the

Commission for a license for a repository (or for any amendment to such a license), the Secretary may submit a petition to the Commission for issuance of the license or license amendment on an interim basis prior to the conduct or completion of any required hearing upon such application.

(B) The Commission shall grant the petition submitted under subparagraph (A) and issue the license or license amendment on an interim basis if the Commission or its designee determines that--

(i) in all respects other than the conduct or completion of any required hearing, the requirements of law are met; and

(ii) in accordance with such requirements, there is reasonable assurance that the activities authorized by the license or license amendment during the interim period, in accordance with the terms and conditions of such license or license amendment, will provide adequate protection to the public health and safety during the interim period.

(11) Within 6 months after the date of the enactment of this Act, the Commission shall promulgate its rules and criteria to apply in reviewing license applications for the construction and operation of repositories.

REPOSITORY SITING REVIEW AND REPORTS

SEC. 8. (a) CONSULTATION AND CONCURRENCE.--(1) The State and any tribal council notified of a site identification under section 5(b) shall have the right to participate in a process of consultation and concurrence as soon as the site has been identified pursuant to such section and throughout the life of the repository involved. For purposes of this section, the term ''process of consultation and concurrence'' means a methodology--

(A) by which the Secretary--

(i) keeps the Governor and tribal council fully and currently informed about any potential economic or public health and safety impacts in all stages of the siting, development, construction, and operation of a repository;

(ii) solicits, receives, and evaluates concerns and objections of the Governor and the tribal council with regard to the repository on an ongoing basis; and

(iii) works diligently and cooperatively to resolve such concerns and objections; and

(B) by which the State can exercise reasonable independent monitoring and testing of on-site activities related to all stages of the siting, development, construction and operation of the repository: Provided, That any such monitoring and testing shall not unreasonably interfere with on-site activities.

(2) The Secretary may enter into written agreements with the Governor of the State in which an identified site is located and with the tribal council of any Indian tribe on whose land an identified site is located in order to expedite the consultation and concurrence process. Any such written agreement shall specify--

(A) procedures by which the State or tribal council may study, determine, comment on, and make recommendations with regard to the possible health, safety, and economic impacts of the repository involved;

(B) procedures by which the Secretary may consider and respond to comments and recommendations made by the State or tribal council, including the period in which the Secretary may so respond;

(C) the documents the Department is to submit to the State or tribal council, the timing for such submissions, the timing for the State or tribal council to identify public health and safety concerns and the process to be followed to try to eliminate those concerns;

(D) procedures by which the Secretary and either the State or the tribal council may review or modify the agreement periodically; and

(E) procedures for public notification of the procedures specified under subparagraphs (A) through

(D).

(3) Except as specifically provided herein, nothing in this Act is intended to grant any State any authority with respect to the siting, development, or loading of any repository.

(b) REPOSITORY DEVELOPMENT REPORTS.--The Secretary shall complete a Repository Development Report and submit it to the President within 6 months after completing the hearing process required under section 7(a). The Repository Development Report shall contain--

(1) an environmental impact statement for the site;

(2) the views and comments of--

(A) the Governor of the State in which the repository site is located and the tribal council of any Indian tribe on whose land the site is located;

(B) the Governor of any other interested State that may be directly and substantially affected by a repository at the proposed site;

(C) the public;

(D) such other Federal agencies as the Secretary considers appropriate; and

(E) the Secretary, in response to any views and comments pursuant to this section;

(3) the license application for the repository prepared by the Secretary for submission to the

Commission, including any relevant environmental impact statements, or, if the Secretary is not required by law to obtain a license from the Commission for the construction of the main shaft of such repository, a document containing comparable information and analysis; and

(4) a plan for the transport of high-level radioactive or transuranic waste to the repository, including an assessment of anticipated environmental, health, and safety impacts and a description of emergency planning procedures.

(c) PRESIDENTIAL REVIEW OF SITES.--(1) Within 60 days after the submission of the Repository Development Report, the President shall either approve the site and transmit notice of the approval and the report to the Congress, or disapprove the site and submit notice of the disapproval to the Congress.

(2) The selection of a site for a repository shall be effective at the end of the 30-day period beginning on the date that the President transmits notice of his approval of such site to the Congress under paragraph (1) unless the Governor of the State in which the site is located has submitted to the Congress a petition for disapproval, or the tribal council of an Indian tribe on whose land the site is located has submitted such a petition. If any such petition

has been submitted, the selection of the site shall not be effective except as provided under subsection (d).

(3) If either House or both Houses are not in session on the day the President's notice of approval of a site and the Repository Development Report are received by the appropriate officers of each House, such Repository Development Report shall be deemed to have been transmitted on the first succeeding day on which both Houses are in session.

(d) CONGRESSIONAL REVIEW OF SITES.--(1) If the President transmits notice of his approval to the Congress under subsection (c) and either the Governor of the State or a tribal council submits to the Congress a petition for disapproval under subsection (b), the selection of such site for the repository involved shall be effective at the end of the first period of 50 calendar days of continuous session of the Congress after the date of the transmittal of such notice by the President to the Congress, unless, during such period, either House of the Congress passes a resolution the matter after the resolving clause of which reads as follows: ''That the ____________________ approves the petition submitted by ____________________ regarding the disapproval of the site at ____________________ for a repository.'' (with the first blank space being filled with the designation of the appropriate House of the Congress, the second blank space being filled with the name of the Governor or the Indian tribe whose petition is approved, and the third blank being filled with the geographic location of the proposed repository site). For purposes of paragraphs (3) through (8) of this subsection, the term ''resolution'' means a resolution described by this paragraph.

(2) Paragraphs (3) through (8) of this subsection are enacted by the Congress--

(A) as an exercise of the rulemaking power of the Senate and the House of Representatives, respectively, and as such are deemed a part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in that House in the case of resolutions described by paragraph (1) of this subsection; and the provisions of such paragraphs supersede other rules only to the extent that they are inconsistent therewith; and

(B) with full recognition of the constitutional right of either House to change the rules (so far as relating to the procedure of that House) at any time, in the same manner and to the same extent as in the case of any other rule of the House.

(3) A resolution once introduced with respect to any site selection shall immediately be referred to the

committee or committees of jurisdiction (and all resolutions with respect to the same site selection shall be referred to the same committee or committees) by the President of the Senate or the Speaker of the House of Representatives, as the case may be.

(4)(A) If any committee to which a resolution with respect to a site selection has been referred has not reported it at the end of 20 calendar days after its referral, it shall be in order to move either to discharge the committee from further consideration of such resolution or to discharge the committee from further consideration of any other resolution with respect to such site selection which has been referred to such committee.

(B) A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has reported a resolution with respect to the same site selection), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(C) If the motion to discharge is agreed to or disagreed to, the motion may not be renewed, nor may another motion to discharge such committee be made with respect to any other resolution with respect to the same site selection.

(5)(A) When all committees to which the resolution was referred have reported, or have been discharged from further consideration of, a resolution, it shall be at any time thereafter in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(B) Debate on the resolution referred to in subparagraph (A) shall be limited to not more than four hours, which shall be divided equally between those favoring and those opposing the resolution. A motion further to limit debate shall not be debatable. An amendment to, or motion to recommit, the resolution shall not be in order, and it shall not be in order to move to reconsider the vote by which the resolution was agreed to or disagreed to.

(6)(A) Motions to postpone, made with respect to the discharge from committee, or the consideration of, a resolution, and motions to proceed to the consideration of other business, shall be decided without debate.

(B) Appeals from the decision of the Chair relating to the application of the rules of the Senate or the House of Representatives, as the case may be, to the procedure relating to a resolution shall be decided without debate.

(7) Notwithstanding any of the provisions of this subsection, if either House has approved a resolution with respect to a site selection, then it shall not be in order to consider in that House any other resolution with respect to the same site selection.

(8) For the purpose of this subsection--

(A) continuity of session is broken only by an adjournment of the Congress sine die; and

(B) the days on which either House is not in session because of an adjournment of more than three days to a day certain are excluded in the computation of any period of time in which Congress is in continuous session.

(e) PROJECT DECISION SCHEDULE.--(1) The Secretary shall prepare and update, as appropriate, in cooperation with all concerned Government agencies, a Project Decision Schedule that portrays the optimum way to attain the operation of the repository involved, within the time periods specified in this Act. It shall include a sequence of events for all agencies required to take action, including an identification of the activities in which a delay in the start, or completion, of such activities will cause a delay in beginning repository operation.

(2) Notwithstanding any other provision of Federal law, the Project Decision Schedule shall constitute the lawful decisionmaking deadlines for the agencies concerned. Any Government agency that determines that it cannot comply with the schedule, or fails to so comply, shall submit to the Secretary and to Congress a written report explaining the reason for its failure or expected failure to meet the deadline, the reason why the agency could not reach an agreement with the Secretary, the estimated time for completion of the activity or activities involved, the associated effect on its other deadlines in the Project Decision Schedule, any recommendations it may have or actions it intends to take regarding any improvements in its operation or organization, or changes to its statutory directives or authority so that it will mitigate the delay. The Secretary, within 30 days after recieving such report, shall file with the Congress its response to the agency's report, including the reasons why the Secretary could not amend the Project Decision Schedule to accommodate the agency.

GOVERNMENT AGENCY ACTIONS

SEC. 9. (a) GENERAL.--(1) Government agencies shall assist the Secretary by cooperating and coordinating with the Secretary in the preparation of any necessary reports, including the Project Decision schedule, the Site Identification Report, and the Repository Development Report.

(2) No action of the Secretary or any other Government agency required by this ACt to be taken prior to the effective date of the selection of a repository site shall be considered to be a major Federal action for purposes of the National Environmental Policy Act of 1969, or shall require the preparation of environmental impact statements, except when otherwise specifically provided for in this Act.

(3) The Secretary and all other Government agencies shall, to the maximum extent possible, avoid duplication of efforts in the preparation of reports pursuant to the Naitonal Environmental Policy Act of 1969.

(b) ENVIRONMENTAL PROTECTION AGENCY.--Within 4 months after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency shall, by rule, promulgate generally applicable standards for protection of the general environmental from radioactive material in repositories.

RESEARCH AND DEVELOPMENT ON WASTE DISPOSAL

SEC. 10. (a) SITE AND DESIGN.--Within 42 months after the date of the enactment of this Act (and subsequent to the site characterization activities conducted pursuant to section 6(a)), the Secretary shall begin the mining and construction, at a site characterized pursuant to section 6, of a Test and Evaluation Facility designed--

(1) with a capacity for receiving a minimum of forty, and a maximum of three hundred, full-sized canisters of solidified waste;

(2) for full retrievability of wastes, or other radioactive material used by the Secretary for testing, upon completion of the technology demonstration activities; and

(3) based upon the principle that the wastes shall be isolated from the biosphere in such a way that the initial protection is provided by engineered barriers functioning as a system with the geologic environment.

(b) OPERATION.--Within 78 months after the date of the enactment of this Act, the Secretary shall begin the in situ testing program in which he shall--

(1) conduct in situ tests of bore hole sealing, geologic media fracture sealing, and room closure to establish the techniques and performance for isolation of the waste from the biosphere;

(2) conduct in situ tests with radioactive sources and materials to develop reliable models for radionuclide migration, absorption, and containment within the engineered barriers and the geologic media;

(3) conduct in situ tests to evaluate and improve

models for ground water or brine flow through fractured geologic media;

(4) conduct in situ tests under conditions representing the real time and the accelerated time behavior of the engineered barriers within the geologic environment;

(5) conduct in situ tests to evaluate the effects of heat and pressure on the geologic media, on the hydrology of the surrounding area, and on the integrity of the waste packages;

(6) conduct in situ tests under normal repository conditions to establish the effect of the failure of waste packages and gross release of radionuclides into surroundings, and the effects of various credible failure modes, including but not limited to--

(A) seismic events leading to the coupling of aquifers through the Facility;

(B) thermal pulses significantly greater than the maximum calculated; and

(C) human intrusion creating a direct pathway to the biosphere; and

(7) conduct such other research and development activities as the Secretary considers appropriate, including use of spent fuel for test and evaluation purposes.

(d) LIMITATIONS.--(1) The Test and Evaluation Facility shall not be used as a disposal facility unless so authorized by the Commission pursuant to this Act.

(2) The operation of the Test and Evaluation Facility shall terminate when the Secretary determines that the continued operation of the facility is not necessary for research, development, and demonstration purposes.

(e) ENGINEERED BARRIERS.--The system of engineered barriers and selected geology shall have a design life at least as long as the greater of--

(1) the time period needed for the radiological health hazard of the wastes to become comparable to the radiological health hazard of the uranium ore needed to generate such wastes, or

(2) the design life required by regulations issued pursuant to this Act or the Atomic Energy Act of 1954 for waste repositories.

(f) PROGRAM MANAGEMENT PLAN.--The Secretary shall prepare and update, as appropriate, a Program Management Plan for carrying out the research, development, and demonstration activities required under this Act. Such Plan shall include--

(1) a decision schedule which details how the Secretary will insure that the Test and Evaluation Facility is in operation by the date specified, and

which shall to the maximum extent possible include dates for the start and completion of all significant project milestones;

(2) a description of how the activities undertaken pursuant to this section will be integrated into, and complementary to, the activities undertaken to construct and operate a repository; and

(3) a description of the form and manner in which waste or spent fuel will be placed in the Test and Evaluation Facility.

(g) NUCLEAR REGULATORY COMMISSION ROLE.--(1) Within one year from the date of the enactment of this Act, the Secretary and the Commission shall reach a written understanding establishing the arrangements for consultation and coordination (subject to paragraph (4)) in the planning, construction, and operation of the Test and Evaluation Facility in accordance with this Act. The understanding shall stipulate a schedule, consistent with the dates specified in this Act, for the Secretary's submission of, and the Commission's review of, the following documents:

(A) The Program Management Plan prepared pursuant to subsection (f); and

(B) Such environmental assessments and other reports and information as the Commission may reasonably require to evaluate any health and safety impacts of the Test and Evaluation Facility.

(2) In preparing any comments on the documents submitted by the Secretary, the Commission shall specify with precision any objections that it may have. Upon submission of the Program Management Plan to the Commission, the Secretary shall publish a notice in the Federal Register of the submission of the Plan and of its availability for public inspection, and, upon receipt of any comments of the Commission respecting the Plan, the Secretary shall publish a notice in the Federal Register of the receipt of the comments and of the availability of the comments for public inspection. If the Secretary does not revise the Plan to meet objections specified in the comments of the Commission, the Secretary shall publish in the Federal Register a detailed statement for not so revising the plan.

(3) The understanding shall stipulate the conditions under which the Commission may have access to the Test and Evaluation Facility for the purpose of assessing any public health and safety concerns that it may have.

(4) The understanding shall stipulate the procedures by which the Secretary and the Commission shall, prior to the Secretary's site selection under section 7, reach interagency agreement on performance standards respecting--

(A) the form and packaging for the waste material and spent nuclear fuel which would be emplaced in the repository;

(B) the engineering plans for design, construction, and operation of the repository; and

(C) such other major unresolved safety issues or potential matters of contention whose resolution is necessary for licensing of the site as a repository.

Such performance standards may be jointly promulgated by the Commission and the Secretary in accordance with section 553 of title 5, United States Code.

(5) The Commission's consultation and coordination role in the Test and Evaluation Facility shall terminate on the effective date that a site is selected for a repository at a location other than the location where the Test and Evaluation Facility is sited.

(6) All demonstration facilities authorized by this section shall be constructed and operated as research, development, and demonstration facilities pursuant to section 202 of the Energy Reorganization Act of 1974.

(h) The Secretary shall enter into a written agreement with the Governor of the State in which the Test and Evaluation Facility site is located, and the tribal council of any Indian tribe on whose land the Test and Evaluation Facility site is located, establishing the arrangements for a consultative and cooperative role in the construction and operation of the Test and Evaluation Facility.

(i) The Secretary shall prepare an environmental assessment prior to excavating major shafts for the Test and Evaluation Facility, and shall prepare an Environmental Impact Statement pursuant to the National Environmental Policy Act of 1969, prior to conducting tests with radioactive materials.

RESEARCH AND DEVELOPMENT ON SPENT FUEL

SEC. 11. The Secretary shall, not later than sixty days after the date of the enactment of this Act, establish a research and development program for transitional dry storage of spent fuel in Department facilities, to include integrated technology demonstrations, and to be implemented as follows:

(1) The Secretary shall identify available space or spaces in an existing facility or facilities of the Department, including rooms, bays, chambers, reprocessing-plant canyons, or other areas in the Department's facilities that can be adapted to contain spent fuel for safe, dry storage. Such space or spaces shall be able to initially accommodate a total of not more than 500 tonnes of spent fuel. Each facility shall have initial capacity to hold at least 100 tonnes of spent fuel and shall have sufficient space to permit later expansion to not more than 500 tonnes capacity. For purposes of providing a variety of development and

demonstration experiences, the Secretary shall identify at least two such facilities, if such spaces in such facilities are reasonably adaptable.

(2) The Secretary shall modify, rebuild, or correct such space or spaces to permit demonstration of the level of air tightness, air cooling, air filtering, visual and instrumentation monitoring, and maintenance necessary to technologically demonstrate transitional storage of spent fuel.

(3) The Secretary shall acquire and install racks or other appropriate apparatus for containing a total of not more than 500 tonnes of spent fuel in such space or spaces.

(4) In such spaces, the Secretary shall place an appropriate number of spent fuel elements to test dry storage in galleries. The Secretary shall give preference to using spent fuel from reactors that have lost, or are facing impending loss, of full core reserve in their onsite storage.

(5) The Secretary shall modify, if necessary, and adapt existing equipment at each such facility, or a suitable close-by facility, to demonstrate receiving, unloading, decontaminating, and transferring spent fuel for transitional storage in the spaces described in paragraphs (2) and (3).

WASTE SOLIDIFICATION AND PACKAGING

SEC. 12. Within eighteen months after the enactment of this Act, the Secretary shall provide a report to Congress which--

(1) identifies the process for solidifying waste and includes a summary and analysis of the data to support the selection of the solidification process;

(2) establishes the bases and includes an analysis of the requirements for the number of solidification and packaging facilities needed; and

(3) describes the state of art for the materials proposed to be used in packaging the wastes and the availability of the materials including impacts on strategic supplies and any requirements for new or reactivated facilities to produce the needed materials.

This report is to be included as a part of the Site Identification Report required under section 6(b).

STATE PAYMENT

SEC. 13. The Secretary shall pay to each State and Indian tribe which has entered into an agreement pursuant to section 8(a)(2)--

(1) the sum of $3,000,000 per year from the date on which the site involved was identified to the date on which a site is selected pursuant to section 7: Provided, That such a payment may only be made to a

State in which a potential site for a repository has been identified under section 5(b), or to an Indian tribe on whose land the potential site has been identified under such section; and

(2) the sum of $10,000,000 per year from the date on which the site selection has become effective to the date on which the Secretary declares the repository to be filled to capacity and ready for decommissioning: Provided, That such a payment may only be made to a State in which a site, selected pursuant to section 7, is located, or to an Indian tribe on whose land the selected site is located.

The State or Indian tribe shall have discretion to use the payment for whatever purpose it deems necessary including, but not limited to, the State or tribal activities pursuant to agreements entered into pursuant to section 8. Annual payments shall be pro-rated on a 365 day basis to the specified dates.

JUDICIAL REVIEW OF AGENCY ACTIONS

SEC. 14. (a) JURISDICTION.--Notwithstanding any other provisions of law, the actions of Government officers or agencies pursuant to this Act shall not be subject to judicial review except as provided in this section. Except for review in the Supreme Court of the United States, the United States Court of Appeals for the District of Columbia shall have original and exclusive jurisdiction over--

(1) any civil action for review of any final decision or action of any Government agency or office under this Act: Provided, That no action of any Government agency or office prior to the effective date of the selection of a repository site shall be considered a final decision or action with respect to that site; and

(2) any civil action challenging the constitutionality of any decision made, or action taken, under this Act.

(b) SUPREME COURT REVIEW.-- The Supreme Court of the United States shall have exclusive authority to review any interlocutory judgment or order of the Court of Appeals pursuant to this section. The appellant may file a petition for certiorari or a certification as provided in section 1254 of title 28, United States Code, not later than fifteen days after the decision of the Court of Appeals.

(c) EXPEDITIOUS REVIEW.--The United States Court of Appeals for the District of Columbia and the Supreme Court of the United States shall exercise their powers in such manner as to expedite the determination of cases over which they have jurisdiction under this section. The Court of Appeals shall render its decision on any claim within ninety days from the date the claim is brough unless--

(1) the Court determines that a longer period of time is required to satisfy the requirements of the United States Constitution, or

(2) the Federal agency or officer is not enjoined from complying with the Project Decision Schedule.

(d) TIME LIMITATIONS.--A civil action for judicial review of any decision or action described in subsection (a) may be brought not later than the thirtieth day after the date of the decision or action, except that if a party shows that such party did not know of the decision or action, and that a reasonable person acting under the circumstances would not have known, such person may bring the civil action no later than the one hundred and eightieth day after the date such person acquired actual or constructive knowledge thereof.

PROGRAM FINANCING

SEC. 15. (a) CONTRACTING AUTHORITY.--In the performance of his functions under this Act, the Secretary is authorized to enter into contracts with persons licensed under sections 53, 103, and 104 of the Atomic Energy Act of 1954 for the disposal of waste or spent fuel: Provided, That prices for disposal services under such contracts shall be established (1) on a nondiscriminatory basis, (2) on such basis as will provide sufficient funds in advance of obligation or expenditure for the functions and activities undertaken to carry out the purposes of this Act, and for the recovery of any funds appropriated to carry out this Act over a reasonable period of time, and (3) on such basis as will assure that no person is required to pay more than his anticipated pro rata share of the estimated costs of carrying out this Act: And provided further, That the Secretary shall establish criteria in writing setting forth the terms and conditions under which services under such contracts are to be made available.

(b) LICENSING CONDITIONS.--Notwithstanding any other provision of law, the Commission shall not issue a license to any person to use a utilization or production facility under the authority of section 103 of the Atomic Energy Act of 1954 unless (1) such person has entered into an agreement with the Secretary under subsection (a), or (2) the Secretary affirms in writing that such person is actively and in good faith negotiating with the Secretary for an agreement under subsection (a): Provided, That the Commission, as it deems necessary or appropriate, may require as a precondition to the issuance of a license for any other purpose under section 53, 103, or 104 of the Atomic Energy Act of 1954 that the applicant will have entered into an agreement with the Secretary for the disposal of any waste or spent fuel that may result from the applicant's use of such license.

(c) ESTABLISHMENT OF NUCLEAR WASTE FUND.--There is established in the Treasury of the United States a nuclear waste fund (hereinafter in this section referred to as the ''fund''). The fund shall consist of (1) all receipts, proceeds, and recoveries realized by the Secretary pursuant to subsections (a) and (e), which shall be deposited in the fund immediately upon their realization; (2) the unexpended balances of any moneys available on the effective date of this Act for functions or activities necessary or incident to the disposal of waste or spent fuel, which shall be automatically transferred to the fund on that date; and (3) any appropriations made by Congress to the fund.

(d) USE OF FUND.--The Secretary may make expenditures from the fund in any fiscal year to the extent that such expenditures were included in the annual budget submitted to Congress by the President for that year, without further appropriation and without fiscal year limitation but within such specific directives or limitations as may be included in appropriation or authorization Acts, for any purpose necessary or appropriate to the conduct of the Secretary's functions and activities for the provision or anticipated provision of services for the disposal of waste and spent fuel, including but not limited to (1) the conduct of research, development, and demonstration activities related to the disposal of waste and spent fuel, (2) the acquisition, design, construction, modification, replacement, and operation of facilities necessary or incident thereto, and (3) the making of payments pursuant to section 11.

(e) INVESTMENT.--If the Secretary determines that the moneys in the fund at any time are in excess of current needs, he may request the Secretary of the Treasury to invest such excess or so much thereof as he deems advisable in obligations of the United States having maturities suitable for the needs of the fund and bearing interest at rates determined by the Secretary of the Treasury taking into consideration the current average market yield on outstanding marketable obligations of the United States with remaining periods to maturity comparable to the maturities of such investments: Provided, That the interest rate on such investments shall not exceed the average interest rate applicable to existing borrowing.

(f) APPORTIONMENT EXEMPTION.--Receipts, proceeds, and recoveries realized by the Secretary pursuant to this section, and expenditures from the fund, shall be exempt from annual apportionment under the provisions of section 3679 of the Revised Statutes (31 U.S.C. 665); but expenditures may be made from the fund only to such extent or in such amounts as are provided in appropriation Acts.

Department of Energy
Washington, D.C. 20585

NOV 17 1981

Honorable Marilyn L. Bouquard
Chairman, Subcommittee on Energy
Research and Production
House of Representatives
Washington, DC 20515

Dear Madame Chairman:

I am happy to respond to your request for Department of Energy (DOE) views on the Test and Evaluation Facility (T&E) provisions contained in section 11 of the substitute for both H.R. 1993 and H.R. 4697 adopted by your subcommittee.

As you note in your letter of October 22, DOE supports many of the features of the substitute bill. We wish to reemphasize our comments made before your subcommittee during the October 5 hearing on nuclear waste management policy that this bill would represent a substantial contribution to the development of national nuclear waste policy. In fact, many provisions of the bill are consistent with initiatives proposed by the Administration.

With regard to section 11, we endorse the need for a focused R&D program to support the development of a repository, although we believe that legislation so detailed as to preclude flexibility would be undesirable. We believe that a T&E Facility of proper scope and schedule would be a valuable element of such a program. We have started the initial planning necessary to define the scope and timing of such a facility. For the benefit of the committee, we have enclosed a copy of the committee print marked with our suggested changes.

We appreciate your efforts and those of your subcommittee members on this nuclear waste legislation and hope that these comments are helpful.

The Office of Management and Budget advises that it has no objection to the submission of this report for the consideration of the committee.

Sincerely,

Shelby T Brewer

Shelby T. Brewer
Assistant Secretary
for Nuclear Energy

Enclosure

any improvements in its operation or organization, or changes to its statutory directives or authority so that it will be able to mitigate the delay. The Secretary, within thirty days after receiving such report, shall file with the Congress its response to the agency's report, including the reasons why the Secretary could not amend the Project Decision Schedule to accommodate the agency.

RESEARCH AND DEVELOPMENT ON WASTE DISPOSAL

SEC. 11. (a) PURPOSE.—Within forty-two months after the date of the enactment of this Act (and subsequent to the site characterization activities conducted pursuant to section 7(a)), the Secretary shall begin the mining and construction, at a site characterized pursuant to section 7, of a Test and Evaluation Facility for the following purposes:

(1) to supplement and focus ~~the~~ repository ~~site~~ technology activities at one of the more *~~characterization process at the most~~ promising sites under study;*

(2) to provide the conditions under which known technological components can be integrated to demonstrate a functioning repository-like system;

(3) to provide a vehicle for focusing attention on, for evaluating, and for early resolution of potential licensing issues regarding disposal in a repository;

(4) to validate, under actual conditions, ~~the~~ scientific models to be used in the design of the repository;

(5) to refine the design and engineering of repository components and systems and to confirm the predicted behavior of such components and systems; ~~*and*~~

(6) to ~~*determine*~~ evaluate both *the generic and specific geological characteristics relative to isolating disposal materials in the physical environment of a repository;* and

(7) to evaluate the design concepts for packaging, handling, and emplacement of waste at the design rate and to establish operating capability without excessive worker radiation dose.

(b) DESIGN*.—The Secretary shall design the Test and Evaluation Facility—*

(1) with a capacity for receiving a minimum of forty, and a maximum of three hundred, full-sized canisters of solidified waste; except that, if such waste cannot be obtained under reasonable conditions, spent fuel may be used instead of solidified waste;

(2) for full retrievability of solidified wastes, or other radioactive material used by the Secretary for testing, upon completion of the technology demonstration activities; and

(3) based upon the principle that the waste, spent fuel, or other radioactive material shall be isolated from the biosphere in such a way that the initial isolation ~~*protection*~~ *is provided by engineered barriers functioning as a system with the geologic environment.*

(c) OPERATION*.—Within seventy-eight months after the date of the enactment of this Act, the Secretary shall begin* ~~*the*~~ an *in situ testing program in which he* may ~~*shall*~~*—*

(1) conduct in situ tests of bore hole sealing, geologic media fracture sealing, and room closure to establish the techniques and performance for isolation of the waste, spent fuel, or radioactive materials from the biosphere;

(2) conduct in situ tests with radioactive sources and materials to evaluate and improve reliable models for radionuclide migration, absorption, and containment within the engineered barriers and the geologic media: Provided, That such tests shall only be conducted if the Secretary believes there is reasonable assurance that the radioactive sources will not threaten the use of the site as a repository;

(3) conduct in situ tests to evaluate and improve models for ground water or brine flow through fractured geologic media;

(4) conduct in situ tests under conditions representing the real time and the accelerated time behavior of the engineered barriers within the geologic environment;

(5) conduct in situ tests to evaluate the effects of heat and pressure on the geologic media, on the hydrology of the surrounding area, and on the integrity of the disposal packages;

(6) conduct in situ tests under both *normal* and abnormal *repository conditions to establish* safe design limits for ~~*the effect of the failure of*~~ *disposal packages and gross release of radionuclides into surroundings, and the effects of various credible failure modes, including but not limited to—*

(A) seismic events leading to the coupling of aquifers through the Facility;

(B) thermal pulses significantly greater than the maximum calculated; and

(C) human intrusion creating a direct pathway to the biosphere; and

(7) conduct such other research and development activities as the Secretary considers appropriate, including use of waste, spent fuel, or other radioactive materials for test and evaluation purposes, provided such other activities are reasonably necessary to support the repository program.

(d) Limitations.—(1) The Test and Evaluation Facility shall not be used as a disposal facility unless so authorized by the Commission pursuant to this Act or other applicable law.

(2) The operation of the Test and Evaluation Facility shall terminate when the Secretary determines that the continued operation of the facility is not necessary for research, development, and demonstration purposes.

(e) ENGINEERED BARRIERS.—The system of engineered barriers and selected geology shall have a design life at least as long as that which the Commission requires by regulations issued pursuant to this Act or the Atomic Energy Act of 1954 for waste repositories.

(f) PROGRAM MANAGEMENT PLAN.—The Secretary shall prepare and update, as appropriate, a Program Management Plan for carrying out the research, development, and demonstration activities required under this Act. Such Plan shall include—

(1) a decision schedule which details how the Secretary will insure that the Test and Evaluation Facility is in operation by the date specified, and which shall to the maximum extent possible include dates for the start and completion of all significant project milestones;

(2) a description of how the activities undertaken pursuant to this section will be integrated into, and complementary to, the activities undertaken to construct and operate a repository; and

(3) a description of the form and manner in which radioactive materials used for facility tests *will be placed in the Test and Evaluation Facility.*

(g) NUCLEAR REGULATORY COMMISSION ROLE.—(1) Within one year from the date of the enactment of this

Act, the Secretary and the Commission shall reach a written understanding establishing the arrangements for consultation and coordination in the planning, construction, and operation of the Test and Evaluation Facility in accordance with this Act. The understanding shall stipulate a schedule, consistent with the dates specified in this Act, for the Secretary's submission of, and the Commission's review of and necessary action on*, the following documents:*

(A) The Program Management Plan prepared pursuant to subsection (e); and

(B) Such reports and other information as the Commission may reasonably require to evaluate any health and safety impacts of the Test and Evaluation Facility.

(2) In preparing any comments on the documents submitted by the Secretary, the Commission shall specify with precision any objections that it may have. Upon submission of the Program Management Plan to the Commission, the Secretary shall publish a notice in the Federal Register of the submission of the Plan and of its availability for public inspection, and, upon receipt of any comments ~~of~~ from *the Commission respecting the Plan, the Secretary shall publish a notice in the Federal Register of the receipt of the comments and of the availability of the comments for public inspection. If the Secretary does not revise the Plan to meet objections*

specified in the comments of the Commission, the Secretary shall publish in the Federal Register a detailed statement for not so revising the plan. The Secretary may proceed with

test or construction r both activities luring the time the lan is being revised r a statement being leveloped for not evising the plan.

(3) The understanding shall stipulate the conditions under which the Commission may have access to the Test and Evaluation Facility for the purpose of assessing any public health and safety concerns that it may have.

(4) The Test and Evaluation Facility and the facilities authorized in section 12 shall be constructed and operated as ~~a~~ research, development, and demonstration facilities and shall not be deemed subject to licensing pursuant to section 202 of the Energy Reorganization Act of 1974.

(h) The Secretary shall enter into a written agreement with the Governor of the State in which the Test and Evaluation Facility site is located, or the tribal council of any Indian tribe on whose reservation the Test and Evaluation Facility site is located, establishing the arrangements for a consultative and cooperative role in the construction and operation of the Test and Evaluation Facility.

(i) The Secretary shall prepare an environmental assessment prior to excavating major shafts for the Test and Evaluation Facility, and shall prepare an Environmental Impact Statement pursuant to the National Environmental Policy Act of 1969, prior to conducting facility *tests with radioactive materials.*

the Secretary identifies a site, the Secretary shall as soon as possible notify the Governor of the State in which the site is located, or the tribal council of any Indian tribe on whose reservation the site is located, of such identification and the basis therefor. Additional sites may be identified after the one year period, following the same procedure as if such sites had been identified within that period.

SITE CHARACTERIZATION

SEC. 7. (a) IN GENERAL.— Within three years after the date on which the Site Identification Report is submitted pursuant to subsection (b), the Secretary shall have completed, in accordance with this section, appropriate site characterization activities for the purpose of selecting a site for a licensed repository at no fewer than three such sites: Provided, That three sites shall be sufficiently characterized, within two years after the date on which the sites are identified, to permit the Secretary to choose a site pursuant to section 11 for the Test and Evaluation Facility. Additional sites may be characterized after the three-year period, following the same procedures as if such sites were to be characterized within that period.

(b) REVIEWS.—Within six months after identifying the sites pursuant to section 6(b) and before beginning site characterization activities at a site, the Secretary shall submit a Site Identification Report to the Congress, to the

Commission, to the Governor of the State in which the site is located, ~~*or*~~ and *to the tribal council of any Indian tribe on whose reservation the site is located, for their review and comment. Such report shall include—*

(1) an environmental assessment, prepared by the Secretary in implementing the National Environmental Policy Act of 1969, of the nonradiological impacts of the site characterization activities planned for such site and a discussion of alternative activities for purposes of site characterization which may be undertaken to avoid such impacts;

(2) a plan for site characterization activities to be conducted at such site, which plan shall include—

(A) a description of the site;

(B) a description of the site characterization activities, including the extent of planned excavations, plans for onsite testing of radioactive or nonradioactive material, plans for any investigation activities which may affect the ability of the site to isolate radioactive wastes or spent fuel, and plans to control any adverse, safety-related impacts from site characterization activities;

(C) plans for the decontaminating and decommissioning of the site if it is determined un-

APPENDIX

SUMMARY OF ACTIONS TAKEN FOLLOWING THE HEARINGS OF June 17, 18, & October 5, 7, 1981

Following these hearings on nuclear waste management comprehensive legislation, mark up was held on October 21 in Subcommittee on Energy Research and Production when the Bouquard-Lujan proposal was adopted as a complete substitute to the original text of both H.R. 4697 and H.R. 1993. These bills were reported to the full Committee by an 11-0 vote on October 21, 1981.

On November 20, 1981, the full Committee on Science and Technology met under the chairmanship of Mr. Fuqua to mark up H.R. 5016, the draft compromise legislation developed to reflect the concerns of various Committee Members and then introduced by Mrs. Bouquard on November 18, 1981. The Report of the Committee and the bill, H.R. 5016 follow this brief summary.

97TH CONGRESS
1st Session
HOUSE OF REPRESENTATIVES
REPT. 97-
411 Part 1

HIGH LEVEL RADIOACTIVE WASTE MANAGEMENT AND POLICY ACT

DECEMBER 15, 1981.—Ordered to be printed

Mr. FUQUA, from the Committee on Science and Technology, submitted the following

REPORT

together with

ADDITIONAL AND DISSENTING VIEWS

[To accompany H.R. 5016]

[Including cost estimate of the Congressional Budget Office]

The Committee on Science and Technology, to whom was jointly referred the bill (H.R. 5016) to establish a Federal policy with respect to the disposal of high-level radioactive waste from civilian nuclear activities, to provide for the construction, operation, and maintenance of waste disposal facilities, to provide for a program of nuclear waste and spent fuel research and development, and for other purposes, having considered the same, report favorably thereon (with amendments) and recommend that those provisions most generally referred to as nonmilitary research and development provisions in the bill (as amended) do pass.

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COMMITTEE AMENDMENTS

The amendments (stated in terms of the page and line numbers of the introduced bill) are as follows:

Page 2, beginning in line 13, strike out "activities of the Secretary' " and insert in lieu thereof "activities' ".

Page 2, line 14, after "activities" insert "of the Secretary".

Page 3, line 16, insert a comma immediately after "waste" and strike out "or".

Page 3, line 17, after "fuel" insert ", or other highly radioactive material".

Page 4, line 18, before "spent fuels" insert "highly radioactive materials resulting from accidents at nuclear powerplants or other facilities used in civilian nuclear activities,".

Page 7, line 9, strike out "ten" and insert in lieu thereof "one hundred".

Page 10, line 22, strike out "subparagraph" and insert in lieu thereof "paragraph".

Page 11, line 25, strike out "(1)(B)" and insert in lieu thereof "(2)".

Page 12, line 15, strike out "subsection" and insert in lieu thereof "section".

Page 12, beginning in line 19, strike out "site characterization" and insert in lieu thereof "siting research".

Page 12, line 21, strike out "site characterization" and insert in lieu thereof "siting research".

Page 13, line 2, strike out "site characterization" and insert in lieu thereof "siting research".

Page 13, line 22, strike out "nuclear".

Page 14, line 9, strike out "(8)" and insert in lieu thereof "(9)".

Page 14, line 21, after "States," insert "the Indian tribes" and strike out "Nuclear Regulatory".

Page 14, line 22, before "the Secretary" insert "as".

Page 16, line 9, strike out "for Waste Repositories".

Page 16, line 14, strike out "1974," and insert in lieu thereof "1969,".

Page 17, line 16, strike out "(a)" and insert in lieu thereof "(b)".

Page 18, line 2, strike out "section 6(a)" and insert in lieu thereof "this subsection".

Page 18, beginning in line 18, strike out "in consultation with" and insert in lieu thereof "with the concurrence of".

Page 18, beginning in line 20, strike out "site characterization" and insert in lieu thereof "siting research".

Page 18, beginning in line 23, strike out the colon and all that follows down through the period in line 2 on page 19 and insert in lieu thereof a period and the following: "Within thirty months of such date the Secretary shall have sufficiently evaluated three sites to select a site for the expanded siting research activities and for other activities pursuant to section 11.".

Page 19, line 5, strike out "appropriate: *Provided, however,* That facilities" and insert in lieu thereof "appropriate. Facilities".

Page 19, line 7, strike out "such" and insert in lieu thereof "any".

Page 19, line 14, strike out "subsection" and insert in lieu thereof "section".

Page 19, beginning in line 14, strike out "site characterization" and insert in lieu thereof "siting research".

Page 19, beginning in line 22, strike out "site characterization" and insert in lieu thereof "siting research".

Page 19, line 24, strike out "site characterization" and insert in lieu thereof "siting research".

Page 20, line 5, strike out "site characterization" and insert in lieu thereof "siting research".

Page 20, line 6, strike out "(b)" and insert in lieu thereof "(a)".

Page 20, beginning in line 10, strike out ", to the maximum extent practical,".

Page 20, line 13, strike out "site characterization" and insert in lieu thereof "siting research".

Page 20, beginning in line 20, strike out "site characterization" and insert in lieu thereof "siting research activities,".

Page 40, line 9, strike out "subsection" and inset in lieu thereof "section".

Page 40, beginning in line 14, strike out "site characterization process" and insert in lieu thereof "siting research activities".

Page 40, line 23, strike out "subsection" and inset in lieu thereof "section".

Page 42, beginning in line 18, strike out "media:" through "conducted if" on line 19 and insert in lieu thereof "media, if".

Page 42, line 21, insert "and materials" after "radioactive sources".

Page 43, line 11, insert "to determine the effects of the" before "gross release".

Page 43, line 22, insert "such steps necessary to obtain the" before "use of waste,".

Page 43, line 23, after "materials" insert "(such as, any highly radioactive material from the Three Mile Island nuclear powerplant, or from the West Valley Demonstration Project authorized under Public Law 96-368)".

Page 43, line 25, insert "if" after "program and".

Page 43, line 23, strike out "provided" and insert in lieu thereof "if".

Page 44, line 2, insert after the period the following new sentence: "such in situ testing as authorized in this section shall be designed so as not to compromise the ability of the site to be licensed by the Commission for the operation of a permanent repository.".

Page 44, line 3, strike out "may" and insert in lieu thereof "shall, during the conduct of siting research activities pursuant to section 7,".

Page 44, line 7, strike out "site characterization" and insert in lieu thereof "the conduct siting research".

Page 44, line 14, strike out the period and insert in lieu thereof the following: ", and on the Secretary's conclusion that the activities to be undertaken at such facility will not render the site unsuitable for use as a repository.".

Page 44, after line 24, insert the following new paragraph:

(4) Notwithstanding any other provision of this subection, as soon as practicable following any determination by the Secretary, with the concurrence of the Commission, that the site of the Test and Evaluation Facility is not suitable for the development of a repository, the Secretary shall take such actions as are necessary to remove from such site any radioactive material placed on such site as a result of testing and evaluation activities conducted pursuant to this section. This requirement may be waived if the Secretary, with the concurrence of the Commission, shall find that short-term testing and evaluation activities will not endanger the public health and safety.

Page 45, beginning in line 9, strike out "consultation" and insert in lieu thereof "review, consultation,".

Page 45, line 25, insert after the period the following new sentence: "No shafts may be excavated for the Facility until the Secretary and the Commission have reached the written understanding required under this section.".

Page 46, line 2, strike out "section 12" and insert in lieu thereof "section 12(d)".

Page 46, line 21 strike out "site characterization" and insert in lieu thereof "siting research".

Page 46, after line 23, insert the following new subsection:

(j)(1) The Commission shall carry out a continuing analysis of the activities undertaken pursuant to this section to evaluate the adequacy of attention to public health and safety considerations.

(2) The Commission shall make such reports to the President, the Secretary, and the Congress as it deems appropriate concerning the conduct of activities under this section.

Page 48, after line 17, insert the following new subsection:

(c) In carrying out the demonstration program at the site of a nuclear powerplant pursuant to subsection (a), the Secretary may, with the concurrence of the Commission, place spent fuel from such nuclear powerplant in an onsite demonstration facility prior to the owner of such nuclear powerplant obtaining a license from the Commission relative to such facility if the data to be obtained from the onsite demonstration is necessary to obtain such a license from the Commission. The owner of such nuclear powerplant must proceed with all due diligence to obtain such a license from the Commission.

Page 48, line 18, strike out "(c)" and insert in lieu thereof "(d)".

Page 48, line 19, strike out "paragraph" and insert in lieu thereof "subsection".

Page 49, line 1, strike out "(d)" and insert in lieu thereof "(e)".

Page 49, line 10, strike out "The" and insert in lieu thereof "(a) Subject to subsection (b) the".

Page 49, line 10, strike out "(subject to the next sentence)".

Page 49, line 11, strike out "pay" and insert in lieu thereof "make payments".

Page 49, line 12, strike out "9(a)(2)—" and insert in lieu thereof "9(a)(12)" in accordance with the following:

Page 49, line 13, strike out "the sum of $3,000,000 per year" and insert in lieu thereof the following: "The Secretary shall pay an amount equal to 75 per centum of the expenses incurred by such State or Indian tribe in engaging in any monitoring, testing, evaluation, or other consultation and concurrence activity under section 9(a) with respect to any site. The amount paid by the Secretary under this paragraph shall not exceed $3,000,000 per year".

Page 49, beginning in line 15, strike out "8: *Provided,* That such a" and insert in lieu thereof "8. Any such".

Page 49, line 18, strike out "subsection" and insert in lieu thereof "section".

Page 49, line 20, Strike out "section; and" and insert in lieu thereof "section.".

Page 49, line 21, strike out "the sum of" and insert in lieu thereof "The Secretary shall pay".

Page 49, beginning in line 24, strike out "decomissioning: *Provided,* That such a payment" and insert in lieu thereof "decommissioning. Payment under this paragraph".

Page 50, strike out line 4 and insert in lieu thereof the following:

(b) The Secretary shall make any payment to a State under

Page 50, line 5, insert "of subsection (a)" after "paragraph (1) or (2)".

Page 50, line 9, insert "such" after "both".

Page 50, line 10, strike out "(1) and (2)".

Page 50, line 23, strike out "over—" and insert in lieu thereof "over the following:".

Page 50, line 24, strike out "any" and insert in lieu thereof "Any".

Page 51, beginning in line 1, strike out "Act: *Provided,* That no action of any Government" and insert in lieu thereof "Act. For purposes of this paragraph, no action of any government".

Page 51, line 4, strike out "site; and" and insert in lieu thereof "site.".

Page 51, line 5, strike out "any" and insert in lieu thereof "Any".

Page 52, line 18, strike out "Act: *Provided,* That prices" and insert in lieu thereof "Act. Prices".

Page 53, line 2, strike out "Act: *And provided further,* That the" and insert in lieu thereof "Act. The".

Page 53, beginning in line 14, strike out "subsection (a): *Provided,* That the" and insert in lieu thereof "subsection (a). The".

Page 54, beginning in line 10, strike out "To such extent" down through line 15 and insert in lieu thereof the following: "The Secretary may make expenditures from the fund, subject to authorization and appropriation thereof, for any purpose necessary or appropriate to the".

Page 54, line 24, strike out "14." and insert in lieu thereof "13.".

Page 55, beginning in line 10, strike out "investments: *Provided,* That" and insert in lieu thereof "investments, except that".

PURPOSE OF THE BILL

The purpose of the bill is to establish a federal policy with respect to the disposal of high-level radioactive waste from civilian nuclear activities, to provide for the construction, operation, and maintenance of waste disposal facilities, including a Test and Evaluation Facility as well as permanent repositories, to provide for a program of nuclear waste and spent fuel research, development and demonstration, and for other purposes. The bill establishes the legal and institutional mechanism permitting the disposal of high-level radioactive materials in a repository or repositories, mined deep underground in stable geologic media.

JURISDICTIONAL STATEMENT

The work of the Committee on the bill H.R. 5016 as amended, was limited only to those provisions of the legislation most generally referred to as non-military research and development. Such items of jurisdiction are properly before the Committee. In this way the Committee sought to carefully integrate the research and development program contained in the bill for nuclear waste management into the broader purposes of the bill without in any way extending beyond its proper role and into licensing or other non-R & D matters. In the view of the Committee, none of the amendments adopted to the bill exceed its jurisdiction, and each was subjected to the test of jurisdiction at the time it was offered during the Committee markup of November 20, 1981.

LEGISLATIVE BACKGROUND AND COMMITTEE ACTIONS

The non-military research and development provisions of H.R. 5016 evolved from a series of legislative initiatives of the Committee on Science and Technology and its Members during the 96th and 97th Congresses. These initiatives included: H.R. 7418, the "Nuclear Waste Research, Development and Demonstration Act of 1980," introduced on May 21, 1980 and approved by the Committee by a 30-2 vote on June 4, 1980; H.R. 6627 and H.R. 7449, the fiscal year 1981 DOE authorization bills; H.R. 4019, the "Nuclear Waste Management Research, Development and Demonstration Act of 1979"; H.R. 1852 a related bill with the same title as H.R. 4019; H.R 4818, the "Nuclear Waste Terminal Storage and Technology Demonstration Act of 1979"; and other bills of lesser importance dating back several years.

The other provisions dealing with permanent disposal were derived, in part, from the seven bills on this subject pending in the 97th Congress. These are: H.R. 1993, H.R. 3809, H.R. 2881, H.R. 2840, S. 95, S. 637 and S. 1662.

On February 8, 1981, Mr. Goldwater, Mr. Fuqua, Mrs. Bouquard and Mr. Lujan introduced H.R. 1909, a bill similar to H.R. 7418 from the 96th Congress. H.R. 1909 called for a focused technology demonstration program in high-level nuclear waste management, with at least two demonstration facilities to be constructed in different geologic media. This bill authorized a more limited program than that in H.R. 7418 which required four technology demonstration facilities.

Historically, the Committee on Science and Technology has authorized a broad nuclear waste research and development program which was continued in the fiscal year 1982 DOE authorization bill. This bill with the appropriate modifications became Title X of H.R. 3982, the "Omnibus Reconciliation Act of 1981" (Public Law 97-35). As part of the fiscal year 1982 budget request, DOE had outlined the concept for a Test and Evaluation Facility, very similar to the Committee's approach (in H.R. 7418 and H.R. 1909) as being a technology demonstration facility. The DOE request for the T & E Facility was approved in the Reconciliation Act. However, specific legislative directives are still necessary to properly focus the R & D program on a repository.

Hearings on H.R. 1909 were held by the Subcommittee on Energy Research and Production on February 26, March 19, and June 17-18, 1981. The two Subcommittee mark-ups were held on July 15 and 16, 1981, and the bill was reported, as amended, to full Committee on July 16, 1981. On July 17, 1981, thirteen Members of the Science and Technology Committee wrote to Chairman Fuqua requesting that the full Committee not take action on H.R. 1909 until there was consideration of a comprehensive waste bill. As a result of an agreement reached in light of this emerging consensus, a comprehensive waste management proposal was prepared in draft form at Chairman Bouquard's direction and with the concurrence of Mr. Lujan, the Ranking Republican on the Subcommittee. This Bouquard/Lujan proposal integrated a refined version of the T&E concept from H.R. 1909 into an overall waste repository program.

The Subcommittee on Energy Research and Production held hearings on October 5 and 7, 1981 on comprehensive nuclear waste management issues including the Bouquard/Lujan proposal, the Lundine bill, H.R. 1993, and H.R. 2881. During these Subcommittee hearings the following witnesses testified:

Dr. Shelby Brewer, Assistant Secretary for Nuclear Energy, U.S. Department of Energy;

Dr. Thomas Cotton, Senior Analyst, Office of Technology Assessment;

Dr. E. Linn Draper, Jr., Vice President, Gulf States Utilities Company (representing Edison Electric Institute, Utility Nuclear Waste Management Group and the American Nuclear Energy Council);

Mr. Holmes Brown, Associate Director, National Governor's Association (appearing in behalf of Governor Evans of Idaho, Chairman of the Nuclear Power Subcommittee of NGA);

Mr. Brooks Yeager, Washington Representative, Sierra Club, and

Dr. Dan Metlay, Professor of Political Science, Indiana University at Bloomington (consultant on nuclear waste policy).

On October 6, 1981, a "clean" version of H.R. 1909, as amended by the Subcommittee, was introduced by Mr. Goldwater and fifteen other Members including Mr. Fuqua, Mrs. Bouquard, Mr. Lujan, Mr. Roe, Mr. Lowery of California, Mr. Duncan, Mr. Dannemeyer, Mr. Walker, Mr. Forsythe, Mr. Won Pat, Mr. Bailey of Pennsylvania, Mr. Whitehurst, Mr. Morrison, Mr. Burgener, and Mr. Walgren. As with H.R 1909, this bill was referred only to the Committee on Science and Technology.

The ERP Subcommittee held mark-up on October 21, 1981 and adopted the Bouquard/Lujan proposal as a complete substitute to the original text of both H.R. 4697 and H.R. 1993. These bills were reported to the full Committee, by an 11–0 vote on October 21, 1981.

During the period after the Subcommittee reported comprehensive waste management legislation and prior to the first Committee meeting held to discuss such legislation, the staff of the Subcommittee at Chairman Bouquard's direction drafted compromise provisions with the goal of obtaining broad support of the Members of the full Committee. As a result, the Bouquard/Lujan proposal was modified to reflect the concerns of various Committee Members, particularly with respect to a mission plan, the timing of the T&E Facility construction, and the RD&D provisions on the dry storage of spent fuel.

On October 28, 1981 the Committee on Science and Technology met informally to discuss the provisions of the bill being drafted.

On November 18, 1981, after further discussions and negotiations on the provisions of the bill, Mrs. Bouquard together with 19 cosponsors from the Committee, introduced H.R. 5016, the compromise legislation which was jointly referred to the Committees on

Energy and Commerce, Interior and Insular Affairs, Rules, and Science and Technology.

On November 20, 1981, the Committee met under the chairmanship of Mr. Fuqua to mark-up H.R. 5016. On that date, the Committee on Science and Technology reported the bill with amendments by a recorded vote of 37 to 2.

At the time of the filing of this report, there were 25 cosponsors of the bill from the Committee on Science and Technology. These members included: Mrs. Bouquard, Mr. Lujan, Mr. Fuqua, Mr. Goldwater, Mr. Lundine, Mr. Winn, Mr. Roe, Mr. Walker, Mr. Scheuer, Mr. Carney, Mr. Walgren, Mr. Gregg, Mr. Flippo, Mr. Skeen, Mr. Young of Missouri, Mr. Lowery of California, Mr. Gore, Mr. White, Mr. Volkmer, Mr. Ralph M. Hall, Mr. Forsythe, Mr. Dunn, Mr. McCurdy, Mr. Dymally, and Mr. Glickman.

BACKGROUND AND NEED

There is a national need for a balanced energy program so that this country can utilize coal, nuclear and alternative sources of energy while conserving the dwindling supplies of domestic crude oil and natural gas. The public acceptance of nuclear power as a part of this energy mix depends upon resolution of two major issues: (1) nuclear powerplant safety; and (2) the safe disposal of radioactive waste.

Prior to the accident at the Three Mile Island Nuclear Plant in March of 1979, the most pressing public issue for nuclear power was the waste disposal problem. Since TMI, there has been considerable public, government and industry attention paid to insuring enhanced safety in the operation of light water reactor plants. The passage of the Nuclear Safety R&D Bill (Public Law 96-567) in the 96th Congress and the recent passage of the Nuclear Regulatory Commission authorization bill for fiscal year 1982 in the House are benchmarks of congressional response to these concerns. The provisions in these bills are a synthesis of the congressional response to all the lessons learned from Three Mile Island.

The problem of the disposal of high-level nuclear waste remains a major issue. Civilian nuclear powerplants have been operating over the past 20 years and presently over 70 powerplants are licensed to produce electricity. There are nearly 90 nuclear powerplants scheduled to come online during the next decade, and as they begin to produce electricity the magnitude of the nuclear waste problem will increase proportionally. Nevertheless, it seems clear to the proponents and opponents of nuclear power, that there is a waste problem regardless of the future of the nuclear option.

THE STATUS OF NUCLEAR WASTE TECHNOLOGY

The technology for the safe isolation of nuclear waste is judged to be more than adequate in the view of the technical community. The following are statements of responsible technical groups on the technological status for disposal of high-level nuclear waste in repositories.

Association for Cooperation in Engineering. This association represents 24 major engineering professional societies in the United States, having a combined membership of over 700,000 engineers. The association convened a working committee, called the Coordinating Committee on Energy, to make statements on various aspects of energy. Its statement is:

> Much development of solid waste forms has been done and technology is well in hand, some of it already demonstrated on a large scale. Neither the specifications of solid form nor the location of the repository have yet been decided. It is the lack of these decisions rather than the

lack of technology that stands in the way of the disposal of radioactive waste.

American Institute of Chemical Engineers. The Nuclear Engineering Division of this Insitute has issued a policy statement. It states:

> * * * Satisfactory techniques exist today for safe radioactive materials handling, the reprocessing of spent fuel, and solidification of high-level wastes. * * * Several candidate options for ultimate disposal are ready for demonstration. These techniques are being improved rapidly as the technology continues to advance. Other countries have recognized this, and have overtaken the U.S. in the rate of introduction of efficient nuclear powerplants and waste treatment techniques. * * * The Institute believes that actual demonstration of radioactive waste disposal is sufficiently urgent that it is far better to proceed with an acceptable solution than to delay by looking for unnecessary minor benefits which might possibly emerge from alternatives. * * *

American Physical Society. The American Physical Society, supported by the National Science Foundation, conducted a study on Nuclear Fuel Cycles and Waste Management. The results were published in the professional journal, Reviews of Modern Physics. Following are excerpts:

> * * * The technology exists for recoverable storage of the spent fuel with minimal deterioration to preserve the associated resources, but full-scale demonstration is required before use. * * *
>
> * * * Effective long-term isolation for spent fuel, high-level or transuranic waste can be achieved by geologic emplacement. A waste repository can be developed in accord with appropriate site selection criteria that would ensure low probability that erosion, volcanism, meteorite impact and other natural events could breach the repository. * * *

National Academy of Sciences (NAS). The Academy was founded by the Congress and conducts evaluations of scientific programs for the Nation. It utilizes committees formed of the Nation's highly prestigious scientists. The following named committees are two such groups which have performed studies, including statements on nuclear waste management.

Committee on Nuclear and Alternative Energy Systems. The Committee on Nuclear and Alternative Energy Systems conducted a multiyear, $4 million study of nuclear and other energies, performed by a prestigious group of scientists from around the nation. This report, "Energy in Transition, 1985–2010", reported on January 14, 1980:

> * * * No insurmountable technical obstacles are foreseen to preclude safe disposal of nuclear wastes in geological formations. All necessary process steps for immobilizing high- and low-level wastes have been developed, and

> there are no technical barriers to their implementation.
> * * *

Radioactive Nuclear Waste Committee Former Chairman's Statement. The NAS has a standing Committee on Radioactive Waste Management, which has formed many panels on various waste management problems. Its immediate past Chairman is Professor Ernest F. Gloyna, who is Dean of Engineering at the University of Texas, Austin. The following excerpts are from Dr. Gloyna's presentation to the National Academy of Engineering, the sister academy to the NAS, on November 1, 1979.

> * * * Basically, these storage problems present no new difficulties, because throughout the history of the nuclear industry, it has been necessary to consider, evaluate and utilize the multiple barrier concept for radiation control.
>
> * * * There is a well-developed technology that can be used to establish a geologic repository for pilot and demonstration purposes. There appears to be no technical obstacle to the selection of appropriate site and the design, construction and operation of a subsurface repository. * * *

INSTITUTIONAL CONCERNS

Notwithstanding these statements regarding technological readiness, the Federal Government has not established a definitive policy for long-term disposal of these wastes and this failure has resulted in a diminished level of public confidence in the ability of the Government to prove it can safely dispose of this radioactive material. Thus, as the GAO stated in 1979, the major barriers to the resolution of the nuclear waste issue are institutional.

The GAO June 21, 1979, report on nuclear wastes states:

> * * * While it appears that technical problems can be solved, political and public acceptance are major obstacles that will be difficult to overcome. * * *

Indeed, public concerns about the nuclear option have been increasing because of the failure of the Government to demonstrate the technology or establish a repository program. A number of states have, in effect, prohibited any construction of new nuclear powerplants until safe isolation of wastes is demonstrated. Additionally, restrictions have been imposed on the length of time spent fuel can be stored within a state. Also, the unresolved waste disposal issue and spent fuel storage at reactor site have been raised in the context of licensing proceedings for new nuclear powerplants. As regards a permanent geological repository, a number of states enacted laws either to prohibit locating a repository within the state or requiring some type of state approval of repository location. Some states and communities have even prohibited the transportation of high-level waste and spent fuel through the state or local communities, or imposed similar restrictions on such transportation.

The Committee hearings and the statements made about this problem indicate that a definitive Federal policy on nuclear waste disposal is needed and that clear guidelines and authority for program implementation are needed.

SECTION-BY-SECTION ANALYSIS OF H.R. 5016, AS AMENDED

Section 1. Short title is the "High-Level Radioactive Waste Management and Policy Act".

Section 2. Definitions.

Section 3. Findings—Wastes may create a national problem, State participation important, the technology exists, it is in national interest to resolve the issues. Purpose—To establish policy, to accelerate the program and provide direction to the Secretary, to authorize construction of facilities, to authorize collection of fees, to improve cooperative role with states, to provide technical and financial assistance to states.

Section 4. Application. The Act does not apply to defense waste respositories.

Section 5. Mission Plan. Secretary shall prepare a mission plan for the authorized programs. It includes an identification of information needed to make determinations on siting and constructing repositories and a Test and Evaluation Facility, an identification of information not available, a schedule for developing the required information, an evaluation of problems which could impede implementation of the Act, a discussion of the need to build more T&E facilities and comments on the authorized T&E facility, a discussion of significant results of the R&D program including impact on geologic media and the advantages and disadvantages of using particular media, the guidelines for site identification issued pursuant to section 6(b), siting research and testing details, identification of waste solidification technologies, an estimate of repository capacity needed through year 2020 including number of repositories needed, a schedule for constructing repositories, an estimate of total costs, and an identification of adverse impacts. Plan submitted to agencies for comment within 15 months after passage of Act. Notice to be published in Federal Register and public comments sought when the Secretary submits the plan, when the Secretary receives comments, and when and if the Secretary doesn't comply with suggestions for change. When the Secretary doesn't comply, he must also publish a detailed statement as to why he won't comply. Plan to be submitted to Congress within 17 months after enactment for a period of thirty days as counted in subsection (b)(3) before it becomes effective. Plan to be updated annually. Amendments to the plan to lay before the Congress for thirty days as counted in subsection (b)(3).

Section 6. (a) Within 12 months, the Secretary shall complete a final programmatic EIS consistent with NEPA and with this Act.

(b) Guidelines. Secretary in cooperation with other Government agencies to promulgate guidelines, within 6 months after passage of Act, for the selection of sites. Obligation to promulgate not contingent upon action of other agencies.

(c) Site identification. Secretary to identify at least 3 sites in two geologic media, one of which is other than salt, within 1 year after passage of Act. Subject to Commission requirements, the Secretary must give preference for the initial repository to sites which will retard aqueous transport of radionuclides, and except for already named sites, identified sites shall be more than 15 miles from towns of 1000 or more persons. Other sites may be identified after first year. Each site identified shall be supported by detailed statement. Governors and Tribal Council notified as soon as possible of such identification.

Section 7. Siting Research and Related Activities. (a) Complete, with the concurrence of the Commission, siting research, including site characterization, for at least 3 sites within 42 months after identification of the sites pursuant to section 6(c). Siting research is limited to that necessary to prepare NEPA statements and to make siting decisions. Preconstruction activities on the T&E Facility are authorized at one site. However, no on-site T&E construction is permitted until a decision is made on selection for a permanent repository.

(b) Within 6 months after identifying a site, Secretary shall hold at least one public meeting to receive views and prepare an environmental assessment pursuant to NEPA of nonradiological impacts.

(c) Secretary must use smallest quantity of radioactive materials necessary to achieve the research objectives. Secretary to ensure that radioactive material is fully retrievable. Such material must be removed at the completion of siting research activities. T&E facility exempt from these restrictions.

Section 8. (a) Secretary to hold at least one legislative-type public hearing after sites are evaluated and before Secretary selects sites. If Secretary determines to select site, he notifies Governor and others and submits a Repository Development Report to President for his decision. If site is disapproved, Secretary proposes another site to President within one year of such disapproval.

(b) Submission of application. If the Secretary's site selection is not disapproved, he shall submit a license application to the NRC within 30 days and provide copies. NRC to consider application only on Atomic Energy Act consideration.

(c) NRC to report to Congress two years after receiving the license application and annually thereafter on unresolved issues, and NRC actions. Secretary to supply NRC with any needed information.

(d)(1) License application subject to Atomic Energy Act and Energy Reorganization Act, except that NRC must decide on construction authorization within 24 months after application is submitted. A 12-month extension is permitted if: Secretary agrees to extension, a favorable decision likely in that period, and NRC reports to Congress. If license denied, Secretary to select another site under procedures of Act. NRC to keep itself fully and currently informed on details of repository before it receives application, Secretary to supply NRC with information.

(2) NRC hearings. Parties may submit data, views or arguments as hearing board may require. Oral argument may be scheduled at the request of any party. Discovery may be used. Parties must

submit a summary of known facts and arguments upon which party proposes to rely at the time the proceeding begins, unless hearing board finds that submittal would unduly delay the proceeding.

(3) Adjudicatory hearing may thereafter be scheduled only if there is genuine and substantial dispute over technical matters upon which a licensing decision of NRC is likely to depend. Hearing board must document these facts.

(4) Commission decision in these proceedings is not reviewable by any court unless timely objection was made, and the Commission's decision precluded a fair consideration of the issue.

(5) Hearing board can consider only issues raised by parties or the Commission except in operating license hearings when board can raise issues sua sponte under extraordinary circumstances.

(6) Parties must support contentions with substantial or specific facts.

(7) Secretary must complete repository construction within 6 years after receiving a construction authorization. Secretary to operate repository as soon as possible after receiving license.

(8) Commission may communicate with Secretary at all times to fullest extent of law.

(9) The Secretary's EIS shall satisfy the NRC responsibility under NEPA.

(10) Secretary may petition Commission for interim license while hearings are being conducted. Commission shall grant petition if in all other respects the law had been met and there is reasonable assurance that public health and safety is protected.

(11) Commission to promulgate rules for reviewing applications within 6 months of passage of Act. Promulgation not contingent on EPA issuance of standards according to Section 10.

(12) Secretary may take title to radioactive material to be disposed of in the repository.

Section 9. (a) States and Tribes entitled to participate in consultation and concurrence process as soon as sites are identified and throughout life of the repository. This process is a methodology by which Secretary keeps Governor or Tribal Council informed, solicits their views, resolves their concerns, and allows the State or Tribe to conduct monitoring and testing provided it does not unreasonably interfere with on-site activities. State, Tribe, and Secretary may enter into agreement to specify the procedures for the above process. Act does not grant States or Tribes authority except as specifically noted.

(b) Secretary must prepare Repository Development Report within 6 months after completing hearing process for a site. This report includes an EIS for site and views and comments of interested parties, Secretary's response to them, license application for repository, and plan for transporting radioactive material to repository.

(c) President has 30 days to review Secretary's site selection. If President approves and State or Tribe does not object, then site selection becomes effective 30 days after approval.

(d) If President approves, and State or Tribe files petition with Congress, then Congress has 40 legislative days to pass a resolution of disapproval of site before site selection becomes effective. Rules relating to Congressional consideration are specified.

Section 10. All concerned Government agencies to assist the Secretary in preparing reports and Mission Plan under Act. Except as specified, no agency action prior to site selection is a major Federal action for NEPA purposes. Agencies to avoid duplication of efforts in preparing NEPA statements. EPA to promulgate generally applicable criteria for protection of the environment within 4 months after passage of Act. Secretary to prepare Project Decision Schedule for all concerned agencies. All agencies to comply or report to Congress as to why they can't comply.

Section 11. (a) R&D on Waste Disposal. Eight purposes of the T&E Facility, mining of which shall be started within 64 months after passage of Act are: to supplement the siting research process; to integrate components into system; to settle licensing issues; to validate models; to refine and confirm engineering; to supplement other site characterization data by determining media-specific geological characteristics; to evaluate design concepts; and to establish operation capability at low radiation exposures.

(b) Design—T&E Facility must be designed so that capacity to be from 40 to 300 canisters of solidified waste, or spent fuel if waste not available. Wastes or spent fuel shall be fully retrievable and shall be isolated from the biosphere using a system of engineered barriers and geology.

(c) T&E operation to begin within 88 months after Act's passage. Testing program shall include in-situ testing of borehole sealing, radionuclide migration, water flow, engineered barriers, waste packages, and various credible failure modes, and such other R&D as appropriate. If the T&E site is not selected for a repository, the testing program is resticted. T&E activities must be designed so as not to compromise the site for a repository.

(d) The DOE shall, while conducting repository siting research, use existing facilities for generic R&D as long as the Secretary deems appropriate.

(e) Limitations. T&E facility may be used as disposal facility only if authorized by the Commission pursuant to this Act. T&E operation to terminate within five years after operation of the initial repository or sooner if the Secretary determines that it is no longer necessary for R&D. If T&E colocated with a repository, NRC concurrence required on decommissioning, on decontamination, and on the Secretary's conclusion that the activities won't compromise the site for a repository. Secretary to cease T&E activities and remove radioactive material if site determined unsuitable for a repository unless Secretary, with Commission concurrence, finds that continuation will not endanger the public health and safety.

(f) Engineered Barriers. The system for isolating wastes to be designed to last at least as long as the time period required by regulations for repositories.

(g) NRC Role. Secretary and Commission to enter into memorandum of understanding establishing arrangements for review, consultation and coordination. Memorandum of understanding shall include a decision schedule for NRC's review of the Mission Plan, and environmental assessments and reports required by the Commission to evaluate any health and safety concerns. No shafts may be excavated until such understanding is reached.

The understanding shall also stipulate conditions under which NRC may enter the facility to assess health and safety concerns. T&E facility and DOE spent fuel R&D facilities not subject to NRC licensing.

(h) Secretary and State or Tribe which hosts T&E site shall enter into written agreement for consultative and cooperative role in construction and operation of T&E facility.

(i) Secretary shall prepare environmental assessment prior to excavating major shafts for T&E facility and Environmental Impact Statement prior to emplacing radioactive materials. Repository site evaluation not limited by this subsection.

(j) Commission shall analyze T&E activities to evaluate adequacy of attention to public health and safety. Reports may be submitted to President, Secretary and Congress on any such analyses.

Section 12. Secretary shall establish a demonstration program for dry storage of spent fuel. The demonstrations shall include cask, caissons, or silo storage technologies with preference given to utilities with a near-term shortage of storage capacity. The Secretary shall enter into agreements for licensed on-site demonstrations except that the demostrations may be operated, with Commission's concurrence, by DOE while unlicensed if utility is diligently pursuing license and data on demonstration is needed to obtain license. The utility must provide the site and the spent fuel, seek the license, construct the facility, operate the facility, and pay construction, operation and maintenance costs. Secretary to provide consultative and technical assistance, and generic R&D, including an R&D program on dry storage at existing facilities with a maximum capacity of 300 metric tons of spent fuel. Secretary's costs not to exceed 25 percent of authorized program. The remaining costs to be paid from the fund or by the utility involved.

Section 13. Secretary shall pay 75 percent of expenses up to $3 million per year of State or Tribe relative to its role from the date a site is identified to the date a site is selected, provided that such state has entered into a cooperative agreement with DOE. Thereafter, the Secretary shall pay $10 million to the States or Tribe where the site is located, from the date site selection is effective to the date that the repository is full. The State or Indian Tribe may use the payment for whatever purpose they deem necessary, and the State must agree to make at least a ten percent payment of the funds received under this section to the localities where the site is located.

Section 14. (a) Jurisdiction. D.C. Circuit Court of Appeals has exclusive jurisdiction over all civil actions regarding final decisions or actions. No Government agency decision or action is considered final prior to effective site selection. Civil actions on constitutional grounds may be brought at any time.

(b) Supreme Court. Supreme Court has exlusive review authority over D.C. Circuit Court of Appeals decisions, provided that appeals must be filed within 15 days of the decision.

(c) Both courts must exercise their power to expedite their determinations. Appeals Court shall rule within 90 days unless the

Constitution requires longer period, or the agency is not enjoined from complying with the Project Decision Schedule.

(d) Actions in the Appeals Court must be brought within 30 days of decision or action, except if party did not have knowledge of the decision or action.

Section 15. (a) Secretary authorized to enter into contracts for disposal services with persons owning waste, and for other activities pursuant to this Act. Fees charged such persons shall provide funds for the entire program. Each person charged no more than his anticipated pro rata share. Secretary shall establish the criteria in writing for such contracts.

(b) NRC precluded from issuing licenses for a production or utilization facility to any person who does not have such a contract unless the Secretary affirms that such person is negotiating with him for a contract. NRC may also condition the issuance of other licenses on the applicant having such contracts.

(c) All funds received by the Secretary to be deposited in the Treasury in a nuclear waste fund.

(d) Expenditures may be made from the fund as authorized and appropriated by Congress.

(e) Secretary can request Treasury to invest excess funds.

(f) Fund assets are not subject to apportionment.

MAJOR MILESTONES IN H.R. 5016, AS AMENDED

DEPICTING INTEGRATION OF T. & E. FACILITY WITH REPOSITORY DEVELOPMENT

Activity	Date
Assumed passage of act	Jan. 1, 1982
EPA issues standards	May 1, 1982
DOE issues guidelines	July 1, 1982
NRC issues license criteria	July 1, 1982
DOE publishes programmatic EIS	January 1, 1983
DOE identifies 3 sites	January 1, 1983
DOE submits mission plan to Congress	June 1, 1983
DOE/NRC issue memo of understanding	January 1, 1983
DOE/State reach agreement	January 1, 1983
DOE completes public meeting and publishes environmental assessment.	July 1, 1983
DOE starts site characterizations	July 1, 1983
DOE selects T. & E. site and begins preconstruction activities	July 1, 1985
DOE completes site characterizations	July 1, 1986
DOE completes hearing on site	October 1, 1986
DOE completes repository development report	January 1, 1987
DOE selects first site.	January 1, 1987
President decides	February 1, 1987
Petition period ends	March 1, 1987
Congress decides	May 1, 1987
DOE begins onsite T. & E. facility construction	May 1, 1987
DOE submits application to NRC	June 1, 1987
DOE completes T. & E. construction and begins operation	May 1, 1989
NRC decides on construction authorization (option)	June 1, 1989
DOE/NRC decide on extended consideration (option)	June 1, 1990
DOE completes repository construction (option)	June 1, 1995
DOE completes construction on extended schedule (option)	June 1, 1996

COMMITTEE VIEWS

Section 2. Definitions. The Committee intends the research and development provisions contained in the bill, as amended, to establish the policy and the authority to overcome the political and institutional problems preventing the disposal of high-level radioactive waste from civilian activities. In this regard, the definitions of the various terms have been carefully constructed to accomplish specified purposes.

The term "agency" is defined to include the Executive Branch and independent agencies of the Federal Government. Congress and the judiciary are not included.

The term "atomic energy defense activities" is intended to include any activity of the Secretary in carrying out defense related functions. The scope of the bill is not intended to extend over such activities.

The term "civilian nuclear activities" includes all nuclear activities other than atomic energy defense activities. This would include all non-military research and development activities related to nuclear energy, any activity serving, or related to, nuclear powerplants used for the production of steam or electricity, and any government agency or quasi-government agency activity related to non-military nuclear activities such as those of NASA and the Tennessee Valley Authority.

The term "disposal" is broadly defined so that the repository could be used for discarding any highly radioactive material.

The term "disposal package" is defined to include the container in which the radioactive materials are placed plus any material utilized to cover the container once emplaced in the repository, such as bentonite clay which would be used to seal the container from any water that may enter the repository.

The term "engineered barriers" includes all of the man made devices and other materials used at the repository site to prevent the release of radionuclides into the native geology.

The term "high-level radioactive waste" means all highly radioactive materials other than most types of spent fuel. Spent fuel, which is designated by the Secretary to be technically unsuitable for reprocessing, is included in the definition because this spent fuel is truly a waste material. This type of spent fuel would include spent fuel that contains materials which have undergone multiple reprocessing cycles and that are likely to impede the nuclear reaction process to the extent that another reprocessing cycle would be technically unjustifiable. Also included in this type of spent fuel would be damaged spent fuel not easily introduced into the reprocessing cycle.

The term "nuclear waste repository" means a deep geologic facility. Depending on the rock form, deep can be interpreted as anywhere from 1,000 to 3,000 feet below the surface of the earth. The Committee notes that it does not intend to limit the maximum depth of the T&E Facility, which should be set pursuant to technical requirements. The term "disposal" is specifically used within the definition of a repository as well as other key terms such as high-level radioactive waste and spent fuel. The Committee intends that the T&E Facility should be capable of receiving any highly radioactive material.

The term "site characterization" means that process used by the Department of Energy and concurred in by the Commission to determine the suitability of a site to host either a Test and Evaluation Facility or a repository, or both. It does not include the entire siting research process called for in the bill because it does not include preliminary borings, geophysical testing and other investigations needed to determine whether a site characterization should be undertaken. The term "siting research" is used in the bill to include all activities undertaken at the site, including site characterization, preliminary borings and all testing and investigations necessary to determine the suitability of a site for a Test and Evaluation Facility, or a repository.

The term "spent fuel" is defined to include any irradiated nuclear fuel that has been removed from a civilian nuclear powerplant, research reactor, or any other experimental-type reactor not operated for any atomic energy defense function. It is defined separately from waste, since it contains valuable unburned uranium and plutonium. The Committee notes that the energy content of spent fuel discharged annually from the existing nuclear powerplants is the equivalent of 250 million barrels of oil. If breeder reactors are used the energy equivalent could be raised to about 12 billion barrels of oil annually.

The term "Test and Evaluation Facility" is intended to mean a small-scale demonstration repository, which would not be used for permanent disposal unless scaled-up and licensed by the Nuclear Regulatory Commission using the full panoply of procedures called for in the bill.

Section 3. Findings and Purposes. The Committee supports the view of the majority of scientists and engineers, that the technology exists to provide reasonable assurance that high-level radioactive waste or spent fuel can be safely disposed of in a repository. Finding number (3) unequivocally states this view. The Committee finds that although the technology is known, further research, development and demonstration is necessary to integrate the technological components in a deep geological environment into a working system and to establish the data and information to make a reliable decision on the operation of a permanent repository.

The bill establishes the federal policy and responsibilities for the disposal of high-level radioactive waste. This purpose is identified in purpose number (1) of the bill.

The bill provides a focus for the Secretary of Energy in carrying out the nuclear waste management program currently authorized in the Department of Energy. Since the only program that is currently authorized is a broad research, development and demonstration program, this bill is intended to provide the direction to the Secretary to focus this RD&D program on developing a repository through the intermediate step of the T&E Facility.

Another purpose of the bill which is explained in greater detail in the Committee views for Section 12 is, in part, to provide for the development of facilities to demonstrate the dry storage of spent fuel. The Committee notes that dry storage technology may be the least expensive method for storing spent fuel prior to its reprocessing or disposal.

Purpose number (4) of the bill is to generate sufficient funds to carry out the program through collection of a fee pursuant to contracts with those who may be desiring disposal services.

Purpose number (5) is to provide for an improved State/Federal cooperative role in the RD&D program and in the disposal of high-level radioactive waste. This would include, as noted in purpose number (6), providing financial assistance to the States or Indian Tribes as the case may be to help and foster State participation in the authorized programs.

Section 4. Application. The Committee intends that none of the provisions of the Act apply to facilities that would be used for radioactive wastes resulting from atomic energy defense activities. This would not prevent the Secretary from disposing of defense related wastes in the civilian repository, provided that the Secretary complies with all of the requirements of the Nuclear Regulatory Commission. The Committee emphasizes that it intends to preserve the status quo relative to such wastes.

Section 5. Mission Plan. The Committee intends that the Secretary prepare a comprehensive report or Mission Plan to serve as a planning blueprint for the programs authorized under the Act. The Committee intends that the Secretary should (1) identify the significant information which should be available prior to making responsible decisions, (2) identify what information is not available to make such decisions, and (3) be required to prepare a schedule for developing that information.

The Committee intends, relative to subsection (a)(3), that the Secretary consult with other government agencies to identify any barriers or problems to carrying out the objectives of the Act.

Relative to subsection (a)(4), the Committee is not prejudging the question as to whether additional test and evaluation facilities at other repository sites would be a prudent investment. The Committee would like to see a discussion on this issue in the Mission Plan so that it may make a decision on this issue at some later date. The Committee is also interested in the Secretary's comments on the T&E Facility which is a considerably more refined concept than proposed by the DOE in the fiscal year 1982 budget request.

Relative to subsection (a)(5), the Committee view is that a rational analysis of the advantages and disadvantages associated with using the particular geologic media for a repository will be helpful in making decisions relative to locating a Test and Evaluation Facility, or a repository.

Relative to subsection (a)(6), the Committee does not intend that the guidelines would be subject to Congressional review as is provided later in this section for the overall plan. The requirement for inclusion of the guidelines in the Mission Plan results from the Committee intention to have the Mission Plan be as comprehensive a document as is possible.

Relative to subsection (a)(7), the Committee intends that a comprehensive description of sites accompanying identification of such sites be prepared to include all those items set forth in the subsection.

Relative to subsection (a)(8), the Committee intends that the Secretary provide sufficient information and analysis to support the selection of the waste solidification process and disposal material packaging techniques. The Committee believes that the technology for waste packaging is an important element of the disposal process that has received too little attention in the past in the DOE program.

Relative to subsection (b)(2), the Committee intends that this process for Government agency review of the Mission Plan take no longer than 2 months, as is evident by the requirements of the next paragraph. The Committee expects that the Secretary fully consider agency remarks, particularly NRC comments. The Committee, therefore, included a requirement that the Secretary publish his reasons for not complying with agency comments. Public comments would also be sought through the Federal Register publication.

Relative to subsection (b)(3), the Committee intends that the Mission Plan would be submitted to it and other appropriate committees of the Congress not later than 17 months after passage of the Act, and that it is not to become effective until 30 days after the date of transmittal as set forth in the paragraph.

Section 6. Identification of Sites. Relative to paragraph (a), the Committee recognizes that the Department has already prepared a Programmatic Environmental Impact Statement on nuclear waste and has published it in October of 1980. The Committee intends that the Department analyze whether this existing Environmental Impact Statement should be supplemented to take into consideration the requirements under this Act. The Committee intends to provide the Secretary with sufficient discretion to publish a supplemental EIS, if needed, rather than have the Secretary republish the October 1980 Environmental Impact Statement under a separate cover.

Relative to subsection (b), the Committee intends that the Secretary's obligation to promulgate T&E Facility and repository site identification and selection guidelines shall not be contingent upon the actions of any other government agency, including the Environmental Protection Agency, in promulgating similar such standards. The Committee recognizes that in the usual course of events, the EPA, NRC and DOE respectively would promulgate their standards, rules and criteria, and guidelines, in the order listed. The Committee expects that the Secretary should decide what these guidelines should be, in consultation with the NRC and EPA, whether or not these agencies comply with the promulgation requirements in this Act.

Relative to subsection (c), the Committee notes that the requirement for two of the T&E Facility or repository sites to be in different geologic media and for one of the sites to be in a media other than salt, was added to conform to the requirements of the Nuclear Regulatory Commission.

The Committee intends that the Secretary, if completely consistent with the Commission's requirements, give preference for the initial repository or T&E Facility to sites with geochemical characteristics that will retard the aqueous transport of radionuclides.

The Committee also intends that the Secretary identify sites for the initial repository or the T&E Facility that are more that 15 statute miles from towns having a population greater than 1,000 persons. The Committee emphasizes that this restriction is not applicable to any primary candidate sites as presently named by the Secretary for a T&E Facility or a repository.

Section 7. Siting Research and Related Activities. Relative to subsection (a), the Secretary is given 2½ years after identifying the sites to evaluate the sites to a sufficient degree to allow him to make a decision on the location of the Test and Evaluation Facility. The Committee intends that this decision be used for the purposes of beginning and completing all preconstruction activities, including procurement of equipment and services, final design ready for construction bid, and other preconstruction activities related to the Test and Evaluation Facility. The Committee expects that the ability to begin preconstruction activities at this time will permit the Secretary to complete on-site construction activities in two years.

In accordance with the other provisions of the Act, the Committee intends that the on-site construction activities related to the T&E facility not begin until after a decision is completed on the initial repository.

The Committee further intends that the time limitations not be construed to limit the ability of the Secretary to identify and conduct activities associated with subsequent repositories or Test and Evaluation facilities after such time period expires.

Relative to subsection (b), the Committee expects that these public meetings will allow the participation of as many private, and particularly local, individuals who wish to be heard.

The Committee notes that the siting research activity in this subsection is intended, in part, to gather sufficient information to enable the Secretary to fulfill his requirements for preparing an Environmental Impact Statement for a Test and Evaluation Facility or repository. In this regard, the Committee agrees with DOE and NRC, that an environmental assessment should be prepared prior to beginning site characterization.

Section 10. Government Agency Actions. Subsection (a) requires that all concerned government agencies assist the Secretary in the preparation of reports required under the Act. The Committee intends that any such assistance, relative to the research and development reports, will likely be needed in the preparation of the Mission Plan and the Project Decision Schedule.

Relative to paragraph (2), the Committee intends that the specific enumeration of the reports required under NEPA will eliminate the uncertainty associated with the nature of the Government's compliance requirements relative to the R&D program and at the same time require compliance with the spirit and intent of NEPA. The Committee intended to obviate the need for making a decision whether or not a Federal action required an environmental impact statement or whether an environmental assessment should be prepared for the R&D activities contained in this bill. These types of decisions have been the subject of interminable litigation in the past. Such litigation would add little or nothing to the authorized R&D program but could add many years of court proceedings to the schedule. These environmental reports are called for five times in the Act. The Committee intends to minimize any possibility for needless law suits that are intended to frustrate the purposes of the R&D program under this Act. The Committee intends that after the effective repository site selection date which coincides with initiation of on-site T&E construction, the general strictures of the National Environmental Policy Act would govern the actions of the various government agencies involved as regards the R&D program.

Relative to paragraph (3), the Committee intends that if any agency deems it necessary to prepare a report on an R&D related activity pursuant to NEPA, that it rely to the maximum extent possible on the evaluations performed by other government agencies. The Committee expects the government agencies to act as efficiently as possible in carrying out the intent of Congress while fulfilling their interrelated responsibilities.

Relative to subsection (b), the Committee recognizes that the EPA standards for the T&E Facility and repository site selection have been in draft form the last two years and that very little if anything has been done in the Agency to finalize these rules. The Committee also understands that the EPA intends to republish the standards in January of this year with a goal of finalizing them in January of 1983. The Committee believes that these standards should be finalized without further delay, and that the 4 month period is sufficient to allow the agency to comply with the law.

Relative to subsection (c), the Committee intends that the Project Decision Schedule would guide the actions of all government agencies required to take action relative to the T&E facility under the Act. The Committee intends that the Secretary be the lead agency representative in scheduling the activities of other government agencies. The Committee believes that the program can be accomplished on a more timely basis if a single agency is responsible for properly planning it. The Committee expects that if all agencies understand at an early stage their responsibilities to act within a specific period of time, they will be prepared to do so, or identify inhibitory problems at that point.

If any problem is foreseen by any government agency required to take action in accordance with the Project Decision Schedule, that agency must report to through the Secretary and to Congress on any actions it intends to take to mitigate the delay that the agency has identified, and to recommend any necessary legislative action that would permit it to comply with the Project Decision Schedule. The Committee believes that this is an important management tool that should be fully utilized by the Secretary and the agencies involved and is hopeful that the other House Committees referred this legislation will share this view for its application to their programs.

Section 11. Research and Development on Waste Disposal. Relative to subsection (a), the Committee recognizes that some of the on-site activities during the siting research phase pursuant to Sec.

7 will be utilized for the Test and Evaluation Facility. This section is intended to pertain to that part of the mining and construction related exclusively to the Test and Evaluation Facility. The restrictions in this section should be construed accordingly.

Subsection (a) stipulates eight purposes for the T&E facility. The Committee intends that the first purpose would include the development of procedures for emplacing wastes, handling wastes, or for doing any other operational procedure at the most promising site. These procedures could be generic or media-specific procedures capable of easy application to repositories in the same media or in different geologies. Sec. 11(d) requires that the Secretary shall also use existing DOE facilities during the conduct of siting research.

Relative to the second purpose, the Committee intends that the Secretary would operate prototypic equipment that with minor modification could be used at any selected repository site. Specifically, this would include equipment related to packaging, handling, transfer and transport of waste, emplacement of waste, retrieval and repackaging of waste, and monitoring.

The Committee believes that integration of technology is a key function of the Test and Evaluation Facility. The Committee intends that the Facility would be used to confirm the designs of repository ventilation systems, including the effectiveness of emplacement of waste, the evacuation of personnel, and the operation of a ventilation system that protects the workers.

The Committee further intends that the Facility would be used to evaluate the equipment performance, reliability and maintenance requirements; to develop and test the operational procedures and administrative control for routine operations and for operation under abnormal or emergency conditions; to demonstrate the in situ fabrication and assembly of waste packages and components; to demonstrate the equipment interface capability, that is, the ability of the equipment to function properly while working as an integrated system; and finally, it would allow the design of instrumentation specially monitoring and control systems to be confirmed.

The third purpose is intended to have the Facility be used in training and certification, and for measurements to project environmental impacts and the effects on local communities and host States.

The Committee envisions that licensing issues will arise during the repository licensing stage that can be easily resolved through the research program at the Test and Evaluation Facility. In this way, the Committee expects that the T&E Facility will be extremely valuable in reducing the time necessary to develop the data to support the conclusion that a repository can be appropriately licensed for operation.

The fourth purpose includes the development of design basis for a ventilation system, which clearly involves complex heat transfer problems.

The Committee intends that the T&E facility would serve as a model for system operation which includes traffic control, and confirmation of engineering scale-up.

The Committee intends that "validation" would involve demonstrating the operational procedures through test runs under various repository conditions. The Committee believes that such test runs will also assist the Commission in assessing the adequacy and appropriateness of the validation techniques.

The fifth purpose includes the measurement of equipment reliability under actual repository conditions and design rates. The Committee expects that such measurements will allow the Department to determine the capacity and through-put of various operations, and to identify the need for redundancy of parts and subsystem components. Maintenance schedules can also be prepared from analysis of such measurements.

The Committee intends that the T&E Facility would be used to demonstrate the capability to maintain and repair equipment under actual and abnormal repository conditions during the presence of highly radioactive materials. The Committee believes that it will serve to demonstrate the capability to prevent the spread of radioactive contamination.

The T&E facility, relative to this purpose, would also serve to evaluate options for new equipment or for modifying and improving existing equipment or procedures.

The sixth purpose recognizes that siting data will be generated through the siting research program conducted pursuant to section 7 of the bill. However, the Committee recognizes the distinct possibility that subsequently it will be discovered that insufficient data had been developed during this process. The T&E facility could thus serve to develop additional data later found to be necessary to support the licensing process.

Additionally, the Committee believes that necessary information will be developed relative to the predicted behavior of the repository following emplacement of wastes. This would include the backfill and retrievability effects and the rate of return to equilibrium conditions of the host rock after sealing the holes.

The seventh purpose involves the verification of the bases for scaling-up the T&E facility to a repository. It would allow the Secretary to determine the prototypic rates for emplacement of waste, and to identify improvements which would be possible in terms of achieving more efficient operations at a larger scale.

The eighth purpose provides that the T&E Facility be used to estimate and reduce the occupational radiation exposures associated with waste handling operations from facility measurements.

Data should be obtained to show that the instrumentation developed for a repository is capable of meeting the requirements for the inspection and monitoring of the performance of control systems.

The Committee further intends that the T&E Facility should be used to test and refine remote inspection procedures for waste retrieval and emplacement operations.

Subsection (c) Operation. The T&E Facility shall be used for generic research and development associated with repositories, geologic media-specific research and development, and site-specific research and development.

The Committee intends that the specified testing program be a minimum program and that the Secretary should, if necessary, propose additional research and development to be conducted at the T&E facility.

The Committee believes that the Secretary should comply with all applicable standards of the EPA and the NRC concerning release of radioactive materials while testing, and all but a de minimis amount of such material that would be lost in the testing, should be retrievable. Additionally, the Committee added a specific provision to require that any in situ testing be designed so as not to compromise the site or render it unsuitable for use as a repository.

The Committee intends that the Secretary have discretion to procure the radioactive materials to be used in the T&E Facility, or to use any such materials already owned by the DOE. The Committee added provisions clarifying that the Secretary may obtain and utilize in the T&E Facility highly radioactive materials from the Three Mile Island nuclear powerplant and from the West Valley Demonstration Project. These disposal materials will probably be the only non-government wastes ready and available for use in the reseaech and development program. Additionally, the Secretary in conducting the research activites can utilize such disposal material in these facilities at no extra cost to the Government.

Subsection (d), requires the Secretary to utilize during the siting research phase the existing facilities of the Department to conduct the necessary generically-applicable tests relating to disposal. The Committee intends that the Secretary make the optimum allocation of his resources so that the testing program is not constrained by the availability of the Test and Evaluation Facility. Existing facilities not supportive of the research and development objectives of this Act, should not be used under this authority.

Subsection (e) Limitations. To prohibit the use of a Test and Evaluation Facility as a permanent disposal facility unless the Commission licenses the scaled-up facility pursuant to this Act and any other applicable law. The Committee requires that, if the T&E facility is located at the site of a repository, the Secretary obtain the Commission's concurrence on his determination that the testing activities to be undertaken at the facility will not render the site unsuitable for use as a repository, and on the decontamination and decommissioning of the facility at the end of its operation.

The Committee intends that the Commission take an active role at the beginning of the Test and Evaluation Facility activities so that the Secretary can proceed with the authorized testing program without fear that the Commission may suddenly find that the testing activity had rendered the site unsuitable for use as a repository. The Committee expects that no matter what testing program is conducted at the site that it will always be possible to recover any radioactive materials which were employed by simply mining them out. Nevertheless, the Committee expects the Commission to take an active role in supplying comments to the Secretary relative to the testing activities to minimize the possibility for later adverse findings by the Commission.

Relative to paragraph (3), the Committee believes that the termination date of 5 years after initial repository operation will probably be sufficient to conclude the major RD&D effort at the T&E facility.

Relative to paragraph 4, the Committee requires the Secretary, following his determination and Commission's concurrence therewith that the site is unsuitable for use as a repository, to terminate the test and evaluation activities conducted at that site. The Secretary is given the discretion to continue these activities if he finds that such continuation will not adversely affect the public health and safety, and the Commission concurs in that finding. The Committee observes that it is the responsibility of the Secretary to protect the public health and safety relative to nuclear research, development and demonstration facilities, and does not expect him to take any action that might endanger the public health and safety. The decision to close the T&E activities is his alone but must be concurred in by the Commission. The Commission's concurrence is an assurance that the activities will not be terminated for other than the permissible reasons.

Subsection (g), Nuclear Regulatory Commission Role. The Committee intends that subsection (g)(3) reaffirm existing law that the Commission shall not have licensing and related regulatory authority pursuant to the Atomic Energy Act of 1954 and the Energy Reorganization Act of 1974 over R&D facilities related to waste disposal or spent fuel storage. The Committee has, however, included various provisions encouraging and requiring a strong advisory role for the Commission because of the tight relationship of the R&D program to the licensed repository.

Subsection (h) provides that an agreement between the State or Tribe and DOE it is expected that such an agreement be similar in nature to the agreement that the Secretary has with the state of New Mexico regarding the Waste Isolation Pilot Plant (WIPP) project. The Committee fully anticipates that the agreement made pursuant to this subsection may be subsumed in any agreement consummated pursuant to section 9.

Subsection (j) requires the Commission to carry out analyses of the test and evaluation activities to evaluate its consideration of public health and safety issues. This evaluation is intended to serve as a vehicle to allow the Commission to monitor the test and evaluation activities so that its concerns can be addressed in an early warning fashion, avoiding the possibility of the Secretary proceeding with certain tests only to find that the Commission has suddenly discovered that the site has been rendered unsuitable for a repository. The Commission is to generate such reports as it deems necessary concerning the Secretary's activities at the site. The Committee reaffirms that it is the Secretary's responsibility to protect the public health and safety relative to the R&D project and that any Commission report is intended to be advisory in nature.

Section 12. Research and Development on Spent Fuel. The Committee intends that subsection (a) require the Secretary to establish up to three demonstration facilities at nuclear powerplants to be used for demonstrating the technology for dry storage of spent fuel. The Committee recognizes that this program is conditioned on the voluntary participation of the various utilities. The Committee intends that the term "utilities" be interpreted to include government cooperatives, public power associations and other organizations owning or operating nuclear powerplants for the production of electricity.

The Committee intends that paragraph (3) of subsection (b) require the Secretary to conduct generic research and development associated with dry storage of spent fuel. The Committee intends, however, that any generic research that is conducted pursuant to this section be done utilizing appropriated funds rather than funds from the waste disposal fund created under the Act.

The Committee intends that subsection (c) permit the Secretary to operate the demonstration facility with the Commission's concurrence prior to licensing if the owner and future operator of the facility is diligently proceeding to obtain a license from the Commission and if the data to be obtained from the facility is necessary to obtain the license from the Commission. The Committee intends to make it very clear that the licensee of the facility is the utility and not the Department of Energy; were it otherwise, the provision would change existing law which exempts DOE spent fuel R&D facilities from licensing by the Commission.

The Committee intends that subsection (e) limit the Secretary's contributions to the dry storage program from appropriated funds made separate from Sec. 15 appropriations or to no more than 25 percent of the total cost of the program as estimated by the Secretary. Included in total cost would be all the costs associated with the demonstration facilities at the nuclear powerplants and all other research conducted pursuant to this section. All remaining costs are to be borne by the specific utilities involved, or, except as specifically provided in paragraph (b)(1) relating to the on-site demonstration facilities and except for the generic research which is to be paid for through appropriations, shall be provided by the Secretary from the fund established under section 15 of the Act.

Section 13. State Payment. The Committee intends that subsection (a) require the Secretary to make payments to the State or Indian Tribe involved if such state or Indian Tribe has entered into an agreement with the Secretary explaining their respective roles in the T&E facility and the repository. The Committee intends that these payments offset the cost of the state or tribe's participation in the program authorized under the Act.

Prior to site selection the Secretary would reimburse 75 percent of the state's costs involved in the siting evaluation process. Such payment shall not exceed $3,000,000 per year. Once the site is selected the Secretary is required to make a $10 million a year payment to the state for program participation associated with the operation of the Test and Evaluation Facility or the repository, and to act as an incentive for the state to host a repository. The Committee intends that the Secretary make 10 percent of any payments it receives available to the localities so that the incentive and reimbursement is shared at the local and state level. The Committee recognizes that, for part of the payment process, this would reduce state reimbursement to 65 percent and in effect require a 10 percent payment to the localities.

Section 14. Judicial Review of Agency Actions. The Committee intends that this section would grant exclusive jurisdiction to the Circuit Court of Appeals for the District of Columbia over civil actions relating to the R&D facilities authorized in the Act. The

Committee intends that no jurisdiction over agency decisions or actions is granted, relative to R&D activities prior to effective site selection for the repository in question. The Committee strongly believes that all actions taken prior to final site selection which coincides with on-side T&E facility construction should not be considered final for purposes of judicial review. An exception is made for any action challenging the constitutionality of any decision under this Act.

The remaining subsections of this section express the intent of the Committee that judicial review be expedited to the maximum extent possible under the law so that the T&E Facility can be constructed without undue delay.

Section 15. Program Financing. The Committee intends that subsection (a) authorize the Secretary to enter into contracts with persons licensed under sections 53, 103 and 104 of the Atomic Energy Act of 1954, or other persons possessing waste or spent fuel who may wish to dispose of such material. The Committee understands that under section 53 of the Atomic Energy Act, the Commission is authorized to issue licenses to possess and use special nuclear material for non-DOE research activities, for medical therapy or for such other uses as the Commission determines to be appropriate. Further, the Committee understands that section 103 of the Atomic Energy Act deals with nuclear powerplants and other non-governmental "utilization or production" facilities and section 104 deals with reactors or "utilization facilities" for use in medical therapy.

The Committee intends essentially that all producers of waste or spent fuel, including R&D products, be eligible to dispose of such materials in the repository. The Committee does not intend to require that any material be used in the T&E Facility, or disposed of because the determination as to what is waste should remain a decision of the owner. The Committee does recognize, however, that the Department will have to estimate the level of waste disposal requirements for the repository so that it can properly estimate pro rata costs to those the Department considers to own or possess waste including R&D-related wastes. The Committee expects the Secretary to work closely with those it considers to own or possess wastes, including R&D-related wastes, to determine the actual quantity that they own, possess, or will ultimately generate for disposal in the repository. The Committee expects the Secretary to use its best efforts at estimating a pro rata, nondiscriminating fee, and should be given reasonable latitude in arriving at the appropriate amount for the costs of the entire program. The Committee expects that disposal fees will be determined by a methodology similar to that used for uranium enrichment services.

Although it is not specifically provided in section 15, the Committee intends that the Secretary have the authority to dispose of government wastes including defense wastes provided that the cost of such disposal are borne by the government through the Congressional appropriation process. Since the quantities of nuclear wastes associated with the government's non-military nuclear R&D programs is small in comparison to the quantities of civilian nuclear powerplant wastes, the Committee expects that the the Secretary will have sufficient latitude to set an appropriately small amount for R&D wastes as a factor in the establishment of the fee for disposal services. The Committee believes that this will avoid the problem of the Secretary having to estimate the quantities of waste which will become available from facilities not yet authorized under the law.

The Committee intends that subsection (c) establish a nuclear waste fund in the Treasury of the United States to be used for all of the program costs incurred pursuant to this Act, except for all generic research and development work not directly supportive of the overall repository program. The Committee expects that the Secretary will make the appropriate budgetary requests through the authorization and appropriation process for such generic research and development.

Under subsection (d), the Secretary may only make expenditures from the fund subject to their authorization and appropriation. The Committee expects that such request for authorization and appropriation would be submitted in the annual budget submitted by the President. The Committee intends that the fund be used for no other purpose but to support the overall repository program including the Test and Evaluation Facility construction and related activities.

COST AND BUDGET DATA

The Committee notes that the repository-related research, development and demonstration program would be financed through fees collected pursuant to contract. Also, in reference to the Congressional Budget Office estimate, it is noted for clarification that there is no limitation on the number of repositories which can be constructed, as the bill provides the legal authority for all necessary repositories.

The Committee estimates that only one T&E Facility and repository would be needed through the end of this century. In this regard, the Committee's cost estimate differs by as much as 50 percent from the CBO estimate in the years beyond 1986.

The Committee further notes that the benefit of such fees is that a significant amount of excess funds need not be collected, contrary to the CBO assumption. The Committee estimate is based on a periodically adjusted fee which is permissible under the provisions of the bill.

There are basically two authorized activities which would not be financed by such fees. These are generally described as generic research and development not directly related to the repository program. Costs in conducting these activities would be incurred in the provision of technical and other services related to the demonstration of dry storage techniques at nuclear powerplants, and in the establishment of any necessary demonstration program related to dry storage at existing facilities, other than at nuclear powerplants.

COMMITTEE COST ESTIMATE

	1982	1983	1984	1985	1986
Estimated authorization level	0.2	0.3	0.5	0.5	0.3
Estimated gross outlays	(1)	.3	.5	.5	.4
Estimated receipts	(1)	.4	.6	.6	.5
Estimated outlays	(1)	−.1	−.1	−.1	−.1

[1] Less than $50 million.

EFFECT OF LEGISLATION ON INFLATION

In accordance with Rule XI, Clause 2(1)(4) of the Rules of the House of Representatives, this legislation is assessed to have minimal inflationary effect on prices and costs in the operation of the national economy.

COST ESTIMATES AND COMPARISON—CONGRESSIONAL BUDGET ACT INFORMATION

The Congressional Budget Office (CBO) has provided the Committee the letter printed below pursuant to Section 403 of the Congressional Budget Act of 1974 (CBA). No information pursuant to Section 308(a) of the CBA has been provided to the Committee by the CBO because H.R. 5016 does not provide for new budget authority.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, D.C., December 9, 1981.

Hon. DON FUQUA,
Chairman, Committee on Science and Technology,
U.S. House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: Pursuant to Section 403 of the Congressional Budget Act of 1974, the Congressional Budget Office has prepared the attached cost estimate for H.R. 5016, the High-Level Radioactive Waste Management and Policy Act.

Should the Committee so desire, we would be pleased to provide further details on this estimate.

Sincerely,

ALICE M. RIVLIN, *Director.*

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: H.R. 5016.

2. Bill title: High-Level Radioactive Waste Management and Policy Act.

3. Bill status: As ordered reported by the House Committee on Science and Technology, November 20, 1981.

4. Bill purpose: The bill authorizes the construction of at least two high-level nuclear waste repositories, the development of a test and evaluation facility to carry out research in the disposal of nuclear waste and spent fuel, and the development, in conjunction with industry, of a research program to develop technology for dry storage of nuclear waste. In addition, the bill requires an extensive siting and site evaluation program and authorizes technical and financial assistance to state governments and Indian tribes in order to mitigate the impacts associated with the construction of the repositories. The bill authorizes the Secretary of Energy to enter into contracts with operators of civilian nuclear power plants to finance the activities authorized by the bill, and limits the appropriations for the dry storage demonstration program to 25 percent of the program's costs. Receipts for disposal services are to be deposited in a nuclear waste fund in the U.S. Treasury. Spending from the fund is subject to authorization and appropriation action.

5. Cost estimate: The expected budget impact in fiscal years 1982-1986 of the activities authorized or mandated by this bill,

assuming the necessary authorization and appropriation action each year, is shown in the following table:

[By fiscal years, in billions of dollars]

	1982	1983	1984	1985	1986
Estimated authorization level	0.2	0.3	0.5	0.5	0.3
Estimated gross outlays	(1)	.3	.5	.5	.4
Less: Estimated receipts	(1)	−.6	−.4	−.5	−.6
Estimated net outlays	(1)	−.3	+.1	....	−.2

[1] Less than $50 million.

A substantial portion of the costs associated with H.R. 5016 will occur after 1986. Depending on the rate of inflation, possible delays in the program, potential technological difficulties, and other uncertainties, gross outlays by the year 2000 could total between $14 billion and $20 billion. However, contractual payments by operators of civilian nuclear plants would be expected to cover these costs, so that over time, the net cost to the federal government would be negligible.

The costs of this bill will fall within budget function 270.

6. Basis of estimate: It was assumed for the purposes of this estimate that the bill would become effective in March 1982 and that a supplemental appropriation would be enacted by July 1982. As a result, significant outlays will begin to occur in fiscal year 1983. Similarly, substantial receipts would not be accrued until fiscal year 1983.

Costs that will be incurred between fiscal years 1982 and 1986 are associated with the siting program and technology development. The estimate is based on data provided by the Department of Energy, and assumes a pattern of licensing and siting activity that would allow construction of a repository to begin by fiscal year 1988. Also included in the estimate were total costs for the dry-storage demonstration program under the assumption that receipts generated by this bill would be sufficient so as not to require any additional appropriation. Any appropriation for this program, not offset by receipts, is limited to 25 percent of the total costs of the program by this bill. The authorization level shown in the table represents the estimated budget authority necessary to finance siting, licensing, and technology development at levels consistent with the assumption that repository construction would be complete by the year 2000. The total authorization level between 1982 and 1986 of $1.8 billion includes $0.9 billion for siting and licensing activity and $0.9 billion for technology research and development.

It is expected that the majority of the costs associated with this bill will be incurred by fiscal year 2000, when all repository construction is expected to be completed. The costs of the bill are projected based on Department of Energy estimates, adjusted for inflation. It is estimated that the first repository would cost about $3 billion, if construction begins in fiscal year 1988. The estimated cost of the second repository is between $4 and $5 billion if construction begins in fiscal year 1994. If it is assumed that beginning in fiscal year 1986, price increases average 5 percent annually, the total cost of the bill would exceed $14 billion. If the estimated annual increase is raised to 7 percent, the projected costs will reach $17 billion. It is not unusual for major government capital projects—defense systems, dams, rail systems, space programs, etc.—to cost substantially more than orginally estimated, due to delays, overruns, changes in specifications, higher than anticipated inflation, and other factors. Thus, construction delays of only 2 to 3 years, plus a 10 percent increase in costs, could raise the cost of the bill to nearly $20 billion.

The bill provides authority for full financing of the activities authorized by the bill through contracts with operators of civilian nuclear power plants. CBO estimates that between $14 and $20 billion in revenue must be generated by fiscal year 2000 in order for no cost to be incurred by the government. Assuming a 1.0 mil per kilowatt hour fee on electricity from civilian nuclear power plants, CBO estimates that sufficient revenue will be generated through the mid-1990s to cover the costs of the bill. CBO's estimate of receipts from nuclear power generation is based on information provided by the Department of Energy, and assumes moderate growth in nuclear power capacity and power generation at between 60 and 65 percent of capacity. Based on CBO's estimated costs for the bill and on estimated receipts accrued through a 1.0 mil per kilowatt hour fee on electricity from civilian nuclear plants, a surplus of $400 million will be accrued by the end of fiscal year 1986. Contract payments would have to increase to 1.5 to 2.0 mil per kilowatt hour to cover the annual costs of the bill by fiscal year 2000.

7. Estimate comparison: None.
8. Previous CBO estimate: None.
9. Estimate prepared by: Jeff Nitta.
10. Estimate approved by:

C. G. NUCKOLS,
(for James L. Blum,
Assistant Director, for Budget Analysis).

COMMITTEE OVERSIGHT FINDINGS AND RECOMMENDATIONS

No oversight findings and recommendations pursuant to Clause 2(1)(3)(A), Rule XI, under the authority of Rule X, Clause 2(b)(1) of the Rules of the House of Representatives are included, in addition to those comments and views contained elsewhere in this report.

COMMITTEE ON GOVERNMENT OPERATIONS

No findings or recommendations on oversight activity pursuant to Clause 2(b)(2), Rule X, and Clause 2(l)(2)(D) of Rule XI of the

Rules of the House of Representatives have been submitted by the Committee on Government Operations for inclusion in this report.

AGENCY VIEWS

Department of Energy Views

Department of Energy,
Washington, D.C., November 18, 1981.

Dr. John Dugan,
Staff Director, Subcommittee on Energy Research and Production, Washington, D.C.

Dear Dr. Dugan: This letter is in response to your question regarding how the Test and Evaluation Facility (TEF) supports the repository licensing process, as described in House Bill H.R. 4697[1] Amended.

Information can be obtained from the TEF that would support the preparation of the FSAR for the repository operating license—primarily as a technique to increase confidence in the operational and safety considerations. In particular, the TEF would:

1. Demonstrate waste handling, emplacement and retrieval technology.
2. Evaluate occupational exposure underground.
3. Demonstrate equipment reliability.
4. Provide personnel training in safe underground waste handling operations and emergency procedures.
5. Resolve repository engineering issues that are not specific to rock type.
6. Provide a facility for conducting generic (non-site specific) tests, as appropriate to address questions raised by NRC during the license review and construction process.
7. Provide confirmation of modeling.

In addition to these generic issues, certain site specific issues would also be addressed if the TEF site were subsequently selected as the repository site. These site specific issues include: in situ tests of bore-hole sealing, geologic media fracture sealing and room closure; in situ tests to evaluate site specific models for groundwater or brine flow through fractured geologic media; and in situ tests to evaluate the effects of heat and pressure on the geologic media and the hydrology of the surrounding area.

Including the TEF in the repository licensing process could accelerate licensing and increase our level of confidence in the waste handling area and may improve waste handling design and operating procedures by:

1. Providing actual operating experience to confirm presumptions/calculations, etc.
2. Improvement of proposed operating procedures for ALARA, etc.

The proposed schedule in H.R. 4697 calls for filing a license application for the construction and operation of the repository approximately 60 months after the date of enactment of the bill, while testing at the TEF is not scheduled until 78 months after the date of enactment. This schedule does not permit experience with the TEF to be factored into the PSAR for a construction authorization. While this is not critical for either licensing or site selection, advancing the schedule for the TEF approximately 18 months would help provide useful information as noted above. In any event, the results of the TEF will be available while NRC is evaluating the issues surrounding the application. Actual experience in the TEF could provide the information NRC needs before granting an authorization.

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[1] H.R. 4697, explained in the Background and Need Section of this report, contains a less refined Test and Evaluation Facility concept than is contained in H.R. 5016.

I hope this will provide you with the information you need. Please let me know if I can provide further assistance on this matter.

Sincerely,

Sheldon Meyers,
Acting Deputy Assistant Secretary
for Nuclear Waste Management
and Fuel Cycle Programs.

CHANGES IN EXISTING LAW

In compliance with Clause 3 of Rule XIII of the Rules of the House of Representatives, there are no changes in existing law made by the bill, as reported.

COMMITTEE RECOMMENDATIONS

In compliance with clause 2(l)(2)(B) of Rule XI of the Rules of the House of Representatives, the bill was ordered reported with amendments by the Committee on Science and Technology on November 20, 1981, by a 37-2 vote, a quorum being present, and the Chairman was instructed to take all necessary steps to bring the bill before the House in cooperation with the Committees on Energy and Commerce, Interior and Insular Affairs, and Rules.

ADDITIONAL VIEWS OF HON. MARILYN L. BOUQUARD, HON. ROBERT A. ROE, HON. RONNIE G. FLIPPO, HON. ROBERT A. YOUNG, HON, RICHARD C. WHITE, HON. HAROLD L. VOLKMER, HON. RALPH M. HALL, HON. LARRY WINN, JR., HON. BARRY M. GOLDWATER, JR., HON. MANUEL LUJAN, JR., HON. ROBERT S. WALKER, HON. EDWIN B. FORSYTHE, HON. WILLIAM CARNEY, HON. JUDD GREGG, HON. RAYMOND J. McGRATH, HON. JOE SKEEN, HON. JIM DUNN, AND HON. BILL LOWERY REGARDING A COMPREHENSIVE NUCLEAR WASTE PROGRAM

The bill, H.R. 5016, is a comprehensive nuclear waste management bill and therefore contains a combination of provisions that are either solely under the jurisdiction of the Science and Technology Committee, jointly under the jurisdiction of the Committee, or nominally under the jurisdiction of other Committees. This comprehensive approach was adopted because there was an overwhelming sentiment of Committee Members that such legislation should be considered and that a bill which authorized solely R&D activities was only a partial answer. Thus, the intention of the full Committee was to carefully integrate the research and development program which the Subcommittee on Energy Research and Production had proposed by incorporating the Test and Evaluation (T&E) Facility concept into the overall waste management program. Integrated in this way, the Test and Evaluation Facility becomes oriented toward enhancing public confidence in the geologic and man-made systems for nuclear waste isolation while also increasing public confidence in licensing through early resolution of technical issues. This strong role of the T&E Facility, which will be used to scope the parameters and verify the capability of the first repository, is a major reason why the schedule for achieving repository construction and operation in the middle 1990s can be achieved. We feel that it is imperative that the repository operation should be scheduled for no later than 1997, thus allowing 15 years to reach the ultimate program goal.

However, from comments made by staff of both the DOE and the NRC, such a schedule is not achievable without a more practical approach to the regulatory approval process for the repository. We feel that the hybrid and interim licensing provisions of H.R. 5016 are, therefore, necessary to preclude the unnecessary delay which would result from application of existing licensing procedures. The hybrid licensing procedures of the bill are similar to the amendments to the Administrative Procedures Act, H.R. 764, which was introduced, with 27 cosponsors, including 10 from the Judiciary Committee, and which is now under active consideration in that Committee. The new licensing procedure would allow for major scoping and focusing of the issues involved so as to avoid repetitious hearing of the issues. The salient aspects of this procedure are, (1) discovery, followed by (2) an oral-evidentiary hearing to scope the issues, followed by (3) a formal, adjudicatory hearing, and finally by (4) a Commission decision. The significant difference from present NRC procedure is the inclusion of the oral-evidentiary hearing step to scope the issues, rather than using the summary disposition procedure (an inherently judicial, rather than administrative procedure).

We also endorse the concept of interim licensing as used here. The interim licensing provisions would allow NRC to maintain this repository schedule, where all requirements of law are met. Furthermore, interim licensing has been repeatedly supported by the Commission, and by the House. In a letter to Chairman Bevill of the Appropriations Committee, the Commission requested such interim licensing for nuclear power plants, which was approved by the House. Further, in testimony before the Senate Committee on Energy and Natural Resources, Chairman Palladino expressed the strong support by a majority of the Commission for interim licensing authority for interim storage of spent fuel, on-site. We feel that this authority is also highly desirable at the construction authorization phase for the permanent repository, and at the licensing phase.

Furthermore, the differences between a repository and a nuclear power plant justify a more practical approach to licensing. First of all, a civilian waste repository is a passive system, not dynamic, such as a nuclear power plant. Secondly, the repository will be built with retrievability of waste assured through the first three to five decades of its existence. This later requirement of complete reversibility should provide even more justification for this more practical licensing process.

We hasten to point out that we do not presume to tell the other Committees how best to draft licensing reform provisions, but simply point out that the licensing reforms of the type that were included in the bill H.R. 5016 are necessary because we cannot afford to delay this program for frivolous or repetitious consideration of issues. Both the fact that the T&E facility provides an unprecedented basis for producing technical confidence as a basis for licensing, and the fact that the repository presents a greatly reduced risk as compared to a power reactor, mean that there is a greater margin of safety involved in modifying the licensing procedures of the NRC.

We think it is also important to recognize two other principal features of this bill. One is the enhanced state participation through consultation and cooperation beginning in the earliest phase of the program. The second is the authorization of a utility fee derived from contracts negotiated by the DOE so that all program cost will be covered except the generic R&D activities. With regard to the state role, the Committee envisions a WIPP-type agreement between the state and the DOE to provide a vehicle for resolution of institutional issues. This should go far in improving the public's perception of the Federal program as both constructive and responsive. Third, the fact that the users of nuclear energy will pay a relatively modest fee, estimated to be about 1 mil per kilowatt hour, to pay for the Test and Evaluation Facility and the civilian geologic repository, should eliminate any criticism that this is a Federal subsidy for nuclear power.

Finally, the sponsors of the legislation made a significant change in the Subcommittee proposal by delaying the on-site construction for the Test and Evaluation Facility by nearly two years so that the site selection process for the permanent repository would be completed. Some had feared that substantial financial investment at the T&E site would prejudice the decision on the permanent site in favor of the T&E site. As a result of this change, any such prejudice is precluded. This modification does mean a slippage in the schedule for the T&E Facility which must be accommodated in the overall program. However, the institutional benefits attendant to this improvement of public perception outweigh any disadvantages.

Marilyn L. Bouquard.
Robert A. Roe.
Ronnie G. Flippo.
Robert A. Young.
Richard C. White.
Harold L. Volkmer.
Ralph M. Hall.
Larry Winn, Jr.
Barry M. Goldwater, Jr.
Manuel Lujan, Jr.
Robert S. Walker.
Edwin B. Forsythe.
William Carney.
Judd Gregg.
Raymond J. McGrath.
Joe Skeen.
Jim Dunn.
Bill Lowery.

ADDITIONAL VIEWS OF CONGRESSMAN STAN LUNDINE ON H.R. 5016

I supported this bill because it represents a major positive step towards a national nuclear waste policy. It contains many of the provisions included in H.R. 1993, legislation which I authored and introduced in Congress earlier this year. H.R. 5016 provides a mechanism for a meaningful and responsible resolution of our long neglected national radioactive waste management program. The primary focus of the bill is the development of permanent geologic disposal facilities for radioactive waste. Such a focus is essential and should be the focus of any legislation finally adopted by the 97th Congress.

In particular, I support very strongly the development of an action-oriented "mission plan" like the one contained in H.R. 5016 to provide the technical and procedural blueprint to insure implementation of a successful national program. Such a planning device was repeatedly identified during hearings before our committee as central to implementation of a successful program. It is needed to increase public confidence in the national program and to direct and provide continuity in program management. Moreover, the mission plan is needed to provide the utilities who will be financing the program with assurances that the program is being well managed. Ratepayers of the affected utilities are entitled to such an assurance.

In my opinion, however, the committee has made an error in judgment by not including in this bill a provision to provide Congress with an opportunity for a definitive procedure to secure Congressional approval of the mission plan. An amendment I offered during full committee markup (which was defeated by a 7-7 division vote) would have authorized a period for congressional oversight and review of the mission plan and an opportunity to disapprove of the plan through adoption of a one House resolution of disapproval. I believe that if no such provision is adopted, the credibility and continuity of the mission plan will be weakened. The Interior and Commerce Committees, therefore, during consideration of this legislation should examine the merits of such a disapproval mechanism for the mission plan.

The mission plan, when coupled with the utility financing provision, are the pivotal provisions in this bill. During this period of budget austerity, any effort to utilize federal resources to develop a radioactive waste management system will be plagued with slowdowns due to lack of funds. The utility trust fund in this bill, a concept first contained in H.R 1993, will insure timely progress toward achieving the goals of this bill.

This committee has attained through difficult negotiations among many members of this committee the integration of a test and evaluation facility into the goal of establishing a permanent disposal facility. This has been a particularly delicate exercise, largely because the test and evaluation facility can easily be misused for purposes outside the realm of relevant research and development. I believe, however, that the provisions in this bill are responsible in this regard, and cannot be regarded as a mechanism to create a "back door" repository or to conduct irrelevant or duplicative research to the goal of bringing a permanent repository on line.

This bill requires that the Secretary of Energy conduct as much generically applicable research as possible at existing Department of Energy research facilities during the site characterization process for potential permanent repository sites. As such, needed research pertinent to repository design and preparation of a license application for a permanent repository site will not be delayed. The bill also provides for the development of a test and evaluation facility at the site initially chosen for the first repository by the Secretary of Energy only after site characterization has been completed, and after the affected state has had the opportunity to petition Congress for disapproval of development of that site for a permanent repository.

These provisions should eliminate a concern that the test and evaluation facility might prejudice the site selection process for the permanent disposal facility in any way. The research objectives of the test and evaluation facility, then, clearly will involve gathering data on site specific issues that have not been resolved during site characterization, but must be for completion of the Nuclear Regulatory Commission licensing process of a permanent facility, and to resolve any generic research issues that could not be resolved at existing Department facilities during site characterization.

Another important aspect of committee action of this bill is the inclusion of a research, development, and demonstration program for dry storage of spent fuel at the site of nuclear powerplants. Dry storage of spent nuclear fuel is an interim solution to the storage problem currently facing utilities with rapidly-filling storage pools.

Because this type of storage can be done at reactor sites, the costs and hazards of transporting spent nuclear fuel to other storage facilities prior to the availability of a repository would be minimized. Dry storage is not yet licensable by the N.R.C., but according to N.R.C. officials, can be licensable within five years. The procedural regulations necessary to license dry storage are in place, but utilities are reluctant to take the risk of attempting to license the first on-site dry storage facility. Data gathered from research conducted at existing D.O.E. facilities under this bill, as well as the collaborative utility-federal program for on-site demonstration of dry storage technologies at reactor sites will provide the necessary impetus for commercialization of these effective, more cost-efficient technologies.

Thus, with efforts to streamline the licensing process for water pool storage of spent fuel at reactors, and with the impetus under this bill for development of on-site dry storage technologies, there is no real need for the federal government to proceed with a federally operated "away from reactor" storage program for utility spent fuel.

All of this notwithstanding, there are provisions in H.R. 5016, as introduced, about which I have serious concerns. Although the committee did not consider sections of this bill that are clearly outside the scope of its legislative jurisdiction, for the benefit of my colleagues on other committees with jurisdiction over this issue, I would like to state my hope that the provisions pertaining to licensing procedures for the permanent repository contained in H.R. 5016 be deleted from the bill.

These proposed licensing changes are defended by their advocates as necessary to insure the timely licensing of the permanent repository. I question this claim, and in fact believe it could actually complicate the licensing process. In February, the Nuclear Regulatory Commission issued the final procedural rule governing the licensing of repositories, and currently the N.R.C. is in the process of development of a technical rule to establish criteria to address the siting, design, and performance of a geologic repository.

The licensing changes in H.R. 5016 would require that controversial changes be made to the N.R.C. final procedural rule, which could erode public confidence. These changes also could impact the evolution of the technical rule, as well. Finally, such changes could result in complicated legal challenges to N.R.C. actions, making the courts the forum for resolution of many issues which should be addressed and resolved during the licensing process.

While these provisions are well intended by their authors as a way of compressing the licensing process, they propose to do so basically by limiting opportunity for public participation in the licensing process and the right of interested parties to raise certain issues at critical stages of that process. I am concerned that such limitations would create the unfortunate impression in the mind of the public that the authority of the N.R.C. to fulfill its regulatory responsibility in this instance for health and safety is being compromised.

One particular irony in the licensing provisions of this bill, which should be noted is section (8)(d)(7)(C) which restricts the issues raised in hearings held prior to the issuance of an operating license for the permanent repository to those health and safety issues not decided during hearings on the construction license. This restriction would effectively prohibit the public, or interested states, from raising issues during the consideration of an operating license that might develop as a result of operating the test and evaluation facility. Such a procedure is totally counter-productive to a meaningful process to bring a permanent repository on line. Moreover, if it is preserved in this legislation, the utility of the test and evaluation facility as a mechanism for gathering useful data to resolve concerns throughout the licensing process is seriously eroded.

The existing N.R.C. procedural regulations have been carefully drawn after many months of careful consideration and debate. There is no legitimate basis to question the efficiency of these current procedures, and certainly no basis to challenge them on the grounds of first hand experience with building and operating permanent geologic disposal facilities for high level nuclear waste.

In conclusion, I would like to commend Chairman Fuqua and Subcommittee Chairman Bouquard for their prompt, positive work on this legislation and urge my colleagues on the Interior and Commerce Committees to complete action on this matter as soon as possible. It is absolutely critical that a national nuclear waste policy be launched without further delay.

STAN LUNDINE

ADDITIONAL VIEW OF CONGRESSMAN DOUG WALGREN

During the Committee consideration of H.R. 5016, I sponsored an amendment with Congressman Ertel to clarify that the high-level redioactive waste materials from the Three Mile Island nuclear powerplant could be utilized in the Test and Evaluation facility and in any other research and development activity conducted pursuant to the Act. It was our intention to provide the Secretary with the explict authority to acquire this waste, knowing that there will not be a civilian facility in which to dispose of this material until the mid-to-late 1990's.

It is important to note that the term "highly radioactive materials" would include the spent fuel in any form in which it is found in the reactor, and any waste which may not be disposed of at a low level waste disposal site. The Secretary has discretion to use these materials if it will serve the purposes of the Act.

I would encourage the Secretary to utilize such TMI materials to the maximum extent possible so that Government's expenditures for R&D activities will yield the maximum public benefit. Not only will required research and development work be conducted, but the Secretary will help to protect the public health and safety, and aid the private sector in handling an unprecedented situation at no additional cost to the Government. I believe this makes economic sense, as well as being practical in effect.

I also feel it is important that federal legislation be expeditiously enacted to move ahead on the clean-up program for Unit #2 and the DOE research and development program on TMI be sustained at planned funding levels so that optimum information can be derived from the damaged core and other TMI components and materials.

Doug Walgren.

ADDITIONAL VIEWS OF THE HONORABLE HAMILTON FISH, JR. (R-NY)

It is clear that our Nation has suffered from the lack of a comprehensive nuclear waste management policy. I believe that this problem must be solved regardless of whether the United States continues to pursue the nuclear energy option. We need to move forward now with a program to build and operate a permanent high-level nuclear waste repository. This repository should be built as quickly as possible, consistent with environmental requirements and procedural safeguards.

In reporting out this legislation, the Science Committee has taken a significant step towards reaching a final solution to our nuclear waste problems. However, it is important to point out, as the Committee report does, that the Science Committee has acted only on matters within its jurisdiction over civilian research and development activities. This must be strongly emphasized, since this legislation also addresses many controversial matters outside the scope of the Committee's jurisdiction.

Because of their relevance in moving forward with a comprehensive nuclear waste program, I believe that it is necessary to point out my strong concerns with several of these matters. This legislation includes provisions that would almost entirely exempt the Nuclear Regulatory Commission from considering any environmental factors during its decisionmaking activities. This is clearly not in our Nation's best interests and should certainly be modified if we are able to reach a successful solution to this most pressing energy problem.

In addition, a licensing hearing has been suggested that would focus the issues covered during the process required to obtain a permanent repository license. Also, the Nuclear Regulatory Commission is empowered to issue interim construction permits and operating licenses. These proposals are advanced as regulatory reform and essential to meet time constraints. What we are proposing here is the first attempt to license a geologic nuclear waste repository, something which our Nation has never done before and which will have significant ramifications for many generations to come. In light of these most important factors, we should only move forward in high-level nuclear waste management in a balanced and thoroughly tested manner. As my colleagues are well aware, public credibility in this effort certainly remains in question and can only be insured through a careful and complete licensing process. Without this, public skepticism could easily delay or even halt the program entirely.

In a letter dated November 2, 1981, I asked the Commission to comment on various provisions of the nuclear waste legislation pending before the Science Committee. The Commission's response also expressed several concerns with this legislation. The Commission's response is as follows:

U.S. Nuclear Regulatory Commission,
Washington, D.C., December 11, 1981.

Hon. Hamilton Fish, Jr.,
Committee on Science and Technology,
U.S. House of Representatives, Washington, D.C.

Dear Congressman Fish: We appreciate your interest in the proposed legislation now before the Science and Technology Committee, and hope that our responses to the inquiries in your letter of November 2, 1981 to Mr. John G. Davis prove helpful. We have performed a cursory review of the bill reported by the Subcommittee on Energy Research and Production, and our responses are necessarily brief, addressing what we believe is the general thrust of each question. Due to the sweeping scope of the bill, we may wish to provide an addendum to these responses if subsequent analysis warrants.

We understand and share the desire of the members who reported the bill to expedite the high-level radioactive waste management program. Many of your questions address the efficacy of provisions aimed at shortening the repository licensing process. In general, we believe that several of these provisions will aid us in this endeavor. However, we are unable to guarantee that we can meet the deadlines established by this bill for NRC review and decision on a repository license application given possibilities for delay. Such possibilities could conceivably include an incomplete DOE application, unanticipated technical difficulties, or other questions which may arise—the resolution of which may take longer than the bill's implementation timetable allows for in this first-of-a-kind undertaking.

Sincerely,

Nunzio J. Palladino.

Enclosure: Responses to questions.

Question 1. H.R. 1993 contains several provisions relating to the National Environmental Policy Act (NEPA). In particular, Section 8(d)(9) provides that the Environmental Impact Statement (EIS) prepared by the Department of Energy (DOE) shall also be deemed to also satisfy the Nuclear Regulatory Commission's requirements under NEPA. What is the Commission's position on this provision? Do you believe that this provision is necessary in order to meet the goal of a permanent repository by 1996? Will all relevant environmental impacts associated with the key decisions in the nuclear waste program still be fully considered if the timetable set out in this legislation was followed, as required under NEPA? How long do you estimate it will take the Commission to satisfy its responsibilities under Section 102 of NEPA? Do you believe that this provision would override current judicial interpretations of NEPA? If so, do you believe that environmental impacts will be as fully considered as would have been the case had this provision been omitted from the legislation? Moreover, do you believe that this provision is consistent with the Nation's best interest? Finally, what effect on the schedule set out in the legislation for operation of a permanent repository does this provision have?

Section 10(a)(2) of this legislation provides that no action of DOE or any other government agency required under this Act to be taken prior to the effective date of the selection of a repository site by the Secretary shall be considered to be a major federal action for purposes of NEPA, thereby requiring the preparation of an Environmental Impact Statement. At what stage of development of the overall nuclear waste program does the Commission believe it is in the best national interests to prepare an EIS for its activities pursuant to this legislation? What actions of the Federal government prior to the selection of a repository site by the Secretary would be considered to be major federal actions under NEPA, thereby requiring an EIS?

Answer. The Commission believes that there are arguments in favor of and against full NEPA review by NRC. The advantages are those that may result from the NRC's independent evaluation and the opportunity for interested persons to raise issues for resolution in an adjudicatory process. However, the disadvantages that result from a duplication of effort, unnecessary broadening of the issues in a proceeding that may in any event be extremely complex, and the delays that may be caused by the formal adjudication of the environmental issues are of sufficient impact that they should be avoided.

The provision requiring DOE to obtain NRC concurrence on its plan for an EIS would give the Commission an important tool to assure that the scope, outline, and alternatives to be evaluated in this EIS will be useful for NRC's own decisionmaking purposes. We support the provision in Section 9(b)(1) for DOE's FIS to be prepared "with the concurrence of the Commission on the intended scope, outline, and alternatives to be considered," and it would be helpful to have an explicit clarification in Section 8(d)(9) that the Commission's concurrence is only as to scope, outline, and alternatives addressed.

There are no NRC actions prior to the selection of a repository site by the Secretary which we would consider to be a major Federal action under NEPA.

Commissioners Bradford and Gilinsky agree that there is no need for NRC to write a separate Environmental Impact Statement so long as NRC is required to concur with the intended scope, outline, and alternatives of the DOE statement. However, they believe that the NRC should retain its other NEPA responsibilities. In the waste area it is difficult to distinguish safety issues from environmental issues. If NRC has no NEPA responsibilities, the waste hearing will have to address the potentially time-consuming issue of whether issues are safety issues or environmental issues. Additionally, a significant portion of Part 60 was presumed to be based on NEPA. Without NEPA jurisdiction, some of the requirements thought to be settled will have to be reopened to see whether they might also fall under the Atomic Energy Act.

Question 2. H.R. 1993 presently contains a provision relating to the role of the relevant State and tribal councils in the siting, construction, and operation of a permanent waste repository. This provision (Section 9) provides a "consultation and concurrence" role for the State and tribal council, with the requirement that the State's objections to the location of a permanent site shall be upheld if approved by one House of Congress. Do you have any concerns with respect to this provision, and if so, what are they? Do you support the State Planning Council's recommendations in this manner, and if not, why not? What additional recommendations, if any, do you have with respect to this provision?

Answer. NRC has no current recommendation on the specific procedures for the resolution of state/federal disputes, but we do have concerns about the bill's timing of the consultation and concurrence process. As we have previously noted in Congressional testimony, we would prefer that the opportunity for state nonconcurrence be provided after the Commission had decided to authorize facility construction. The state decision would then come before the commitment of funds for facility construction, but after the Commission had fully developed a factual record and a reasoned statement of its conclusions that would be available for use in the resolution of any state objections. If a state were to continue to object after examination of the record on health, safety, and environmental considerations, after consultation with DOE, and after participation in NRC licensing proceedings, then a strong argument can be made for the process to be suspended pending a review of the record either by Congress, the President or both.

Question 3. Section 12 of this legislation establishes a research and development program for transitional dry storage of spent fuel in existing Department facilities. Do you support this program, and how much funding do you believe this program would require? Would such a program supplant the need for Away-From-Reactor storage of spent fuel from civilian nuclear power plants in the latter half of this decade? Moreover, do you support the general concept of Federal government support for an away-from-reactor program?

Answer. We agree that it is appropriate for the Department of Energy (DOE) to conduct research and development programs designed to test and evaluate various options for providing transitional commercial spent fuel storage capacity pending ultimate disposition of the fuel. Dry storage technologies for aged spent fuel, such as are being investigated by DOE at its Nevada site, appear to be viable alternatives for conventional pool storage. However, we have some question as to the applicability of the particular dry storage research and development program identified in Section 12 in view of the Administration's withdrawal of plans for Federal away-from-reactor storage facilities. As a result of this decision, we believe that most of the necessary increased storage capacity is likely to be established at operating reactor sites. It appears unlikely that large regional or centralized storage facilities, where the gallery or canyon mode of dry storage might be considered, will be developed by industry. If DOE is directed to conduct such a program through this legislation, we lack familiarity with the availability and suitability of existing DOE facilities to comment on the funding that would be required.

Section 12 of this legislation would require DOE to modify at least two existing facilities to provide dry storage for up to 500 tonnes of spent fuel at each facility. If 1000 tonnes of capacity were provided and the spent fuel was obtained from those reactors which first face the need for additional capacity outside of the existing reactor basins, as suggested by Item (4) of Section 12, the requirements for additional away-from-reactor storage would be delayed until about 1989 or 1990.

With respect to Federal storage facilities for commercial spent fuel storage, the Comission consistently has taken a neutral viewpoint on whether such storage should be developed by the government or whether provisions for adequate capacity should be left as a responsibility of the industry. The Commission is prepared to exercise its licensing responsibilities in either case.

Question 4. Section 8(d)(10) of this legislation provides interim licensing authority for the operation of a repository. Do you generally support the need for this authority? Is this authority necessary in order to meet the goal of a permanent repository by 1996? Do yo believe you could meet the timeframe set out in this legislation without this authority?

Answer. The Commission does not support interim licensing authority. First, this facility is too critical to waive the hearing. It is the first of its kind. Second, getting state, local, and general public acceptance is the hardest task for this facility. Interim licenisng strongly undercuts building the needed acceptance.

Without interim licensing authority, the Commission probably would not be able to reach a final decision on construction authorization within 24 months after submission of the application. However, even if the Commission had interim licensing authority, it is not clear that the 24 month goal could be met. In either case, it is not clear whether the goal of a permanent repository by 1996 would be met. The staff would have to provide detailed schedule information before the Commission could make a reasonable judgment. Nevertheless, we believe it would be essential to complete the hearing process, because it is crucial to gaining state, local, and general public confidence.

Separate view of Chairman Palladino and Commissioner Roberts

The purpose of this provision is not clear. We would not object to provisions in the bill to specifically grant the Commission interim licensing authority for the operation of a repository, to be exercised at the Commission's discretion. However, we do not believe that the Commission should be *directed* to grant the license particularly as provided in Section 8(d)(10)(B)(i) and (ii). We believe the repository licensing schedule in the bill should allow for a comprehensive review of the complete application and development of the complete record, prior to issuance of a license for this first of a kind repository. If the applicant can successfully make the argument that an interim licence for the repository is in the National interest and does not affect health and safety, discretionary authority would allow NRC to grant the petition.

Question 5. Section 8(d) of this legislation provides for a statutory licensing process in considering a license application for all or part of a repository. What are your comments on this provision? Do you believe that public participation will be fully and fairly accorded under this situation? Do you believe that this legislative process is necessary to meet the time goals set out in the legislation, or do you believe that the NRC has sufficient authority under other statutes that will allow it to make the appropriate action to meet the time goal set out in this legislation?

Answers. We believe that the provision in Section 8(d) *requiring* the Commission to consider a license application for part of a repository is ill advised. The Commission believes it presently has authority under the Atomic Energy Act, as amended, to establish requirements for a license application, and we have the discretionary authority to set requirements to cover part or all of a repository. However, in this first-of-a-kind undertaking, we do not think it prudent to legislate this restrictive requirement in advance. We would prefer to look at a complete application from DOE for the entire repository in order to properly evaluate geologic and hydrologic conditions at the site for any potential health and safety problems before issuing a license to emplace waste in all or part of the repository.

Although the Commission[1] favors modified hearing procedures, it would prefer a more general provision authorizing use of such procedures rather than these detailed provisions requiring a particular approach. Since the Commission has no experience with these procedures, it is difficult to predict difficulties we might have adapting this approach to our licensing actions. A more general authorizing provision would give us the flexibility to address any difficulties which were identified in the initial proceedings. In addition, these procedures should not be tried for the first time in a waste repository proceeding. Rather, we should be allowed to use them in a few other less complex proceedings so that we can gain experience and develop appropriate procedures.

Additionally, Section 8(d)(6) of the proposed bill imposes a very high threshold for the admission of contentions. The provision requires *prima facie* showing and an affidavit from persons having personal knowledge in order for the Commission to consider an issue. This could be interpreted as requiring potential parties to prove they are right before the issue will be considered by the NRC. Since the Commission itself is studying how its standards for admission of contentions should be modified, the Commission suggests this section be deleted and the issue be left to Commission rulemaking.

Commissioner Bradford's view

I do not favor modified hearing procedures which would require that factual and legal issues meet rigorous tests before they may be the subject of an adjudicatory hearing. Adjudicatory hearings, which the NRC currently uses for all contested power plant licensing issues, are a better way to get an accurate assessment of complex factual issues. If they are run effectively, they will not take significantly longer than informal hearings, but they will be a much more reliable decisionmaking tool. They are more reliable because they permit direct confrontation between the views of different parties under circumstances that allow each party a maximum of opportunity to probe the assumptions and the weaknesses of the other's position. Informal hearings, by contrast, allow the parties to make statements that contain untested allegations and assumptions and that need not face cross-examination. Within limits, this favors the witnesses who are most careless with the truth. In any clash of statements the chances of the fallacious ones prevailing, especially if they are sufficiently financed to be repeated by several witnesses, improve in direct proportion to the informality of the proceeding. As one of the officials who must pass judgment based on the records that will be built at these harings, I ask you in the strongest terms not to change the current adjudiciatory format.

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[1] See following page.

Question 6. Section 11 of this legislation establishes a research and development program relating to the construction and operation of a test and evaluation facility. Do you believe that this facility is necessary in order to meet the current DOE program goals in nuclear waste management, as well as the goals set out in the pending legislation? What do you believe is the optimum role for this facility viewed in the context of the Department's overall nuclear waste program? What do you estimate to be the cost of this facility? How much of this cost would be incurred in any event, should no Test and Evaluation Facility be included? Do you anticipate any savings from the Test and Evaluation Facility, during the life of the program? Do you believe that it would be appropriate to require an NRC license for this facility given the role that this facility will play under the pending legislation? do you believe that there is a need for any other institutional or procedural safeguards in connection with the construction and operation of this facility, given the role that this facility will play in the pending legislation?

Answer. The Commission has no objection to the construction of a T&E facility. We would prefer, however, that it be fully integrated into the framework of our regulations. For optimum usefulness in promoting the goal of licensed geologic disposal, we believe that T&E activities should be conducted at a site suitable for a licensed repository, and developed in accordance with the pre-application review procedures set forth in our 10 CFR part 60 rules for the licensing of geologic disposal. Although the primary focus of these procedures is site characterization to determine the suitability of the geology for a repository, test and evaluation activities could address follow-on considerations of design, materials emplacement, and personnel safety optimization. These activities may be useful in firming up details of conceptual design for a license application, but we do not believe that this second step should substitute for or interfere with the first step, which is determining the geologic suitability of the site. We are unable to estimate the cost of a T&E facility with any reasonable degree of certainty, as it is dependent on a large number of variables. These include the size and design of the facility; the geologic medium; and engineering accommodations for geologic conditions. Whatever this cost turns out to be for a given site, certainly if the T&E facility is at the site which is selected to be the repository, most of its cost would have been required in the normal development of the repository. If, however, the T&E facility, is from the outset, *not* part of a licensed repository development, most of the T&E cost would be additive to the program cost.

As we all know, the nuclear waste issue is one that is extremely emotional. I believe that we can only insure the success of our efforts if we have the public's confidence in the final program which is eventually adopted. In my opinion, an appropriate balance must be struck between the need for a permanent repository and the need to protect environmental requirements and procedural safeguards. Our experience in the research and development area clearly makes this evident. Without this balance, I believe that we will be just hurting our chances of solving the nuclear waste problem. It is certainy in our best interests to fashion a program keeping this goal fully in mind.

HAMILTON FISH, JR.

DISSENTING VIEW OF THE HONORABLE RICHARD L. OTTINGER ON H.R. 5016

H.R. 5016 is a comprehensive nuclear waste management bill which includes provisions relating to both research and development activities and non-research and development activities. As a result of its comprehensive nature, H.R. 5016 was referred jointly to four committees, which were the Committees on Energy and Commerce, Interior and Insular Affairs, Science and Technology, and Rules.

In keeping with its jurisdiction, as defined by clause (r) of Rule X of the Rules of the House of Representatives, the Committee on Science and Technology confined its consideration of the bill to only those provisions which relate to research and development activities. In ordering the bill reported, the Committee on Science and Technology directed that amendments adopted in Committee be included in the reported text, and that no changes be made in those provisions which were not considered by the Committee.

Although the Committee Report clearly states that the Committee remains neutral in regard to the non-research and development provisions of H.R. 5016, such as those in Title VII regarding the licensing procedures of the Nuclear Regulatory Commission, I still cannot support the bill as ordered reported both because of serious incursions on health and safety regulation, the NEPA process, and interference with due process and the right of the public, states and localities to meaningful participation and because of the actions taken by the Full Committee on Science and Technology in regard to the research and development provisions of the bill.

NRC Approval of Test and Evaluation Facility

Most of the Committee on Science and Technology's consideration of H.R. 5016 was confined to provisions relating to the establishment of a test and evaluation facility. Under the terms of the bill, the Secretary of Energy is directed to construct a test and evaluation facility at one of the potential repository sites identified by the Secretary pursuant to procedures established in another section of the bill. In the past, the relationship between a research and development facility and a full-scale licensed repository has proven to be one of the most difficult obstacles in drafting a compromise bill which is agreeable to the three committees having jurisdiction over such legislation.

The establishment of a test and evaluation facility at a particular site prior to the formal selection of that site under the procedures established in the bill, and prior to the opportunity for a state to object to the selection of a site within its borders, created the appearance that a decision had, in fact, been made, thus making the procedures seemingly irrelevant. The Committee has made an effort to address this issue by deferring the initial operation of the test and evaluation facility until after the conclusion of the Congressional Review procedures.

However, H.R. 5016 does not sufficiently address the problem created as a result of allowing the Secretary to establish a test and evalution facility outside of the context of the Nuclear Regulatory Commission review and approval of the Secretary's activities at the site. The concern is that the Secretary, in establishing a test and evaluation facility, might take some action which jeopardizes the future licensability of the site. Moreover, it will be difficult to distinguish which of the Secretary's site-specific activities are related to the test and evaluation facility and which are related to the full-scale repository as they are both to be located off the main shaft.

In order to rectify this problem, I offered an amendment during the course of the full committee's consideration of H.R. 5016 which would have given the Nuclear Regulatory Commission the authority to approve the Secretary's site-specific activities regarding the establishment of a test and evaluation facility. Moreover, my amendment would have authorized the Commission to prohibit any action of the Secretary which endangered the public health and safety. As this amendment was defeated, to a great extent because of the concern of establishing a precedent, and because I believe that NRC approval is essential to maintaining public confidence in the program, for this reason alone I cannot support the bill, as reported by the Committee on Science and Technology.

Those who opposed my amendment argued that the Secretary of Energy would have sufficient motivation to prevent him from undertaking any action which might jeopardize the subsequent licensability of the site. However, the history of DOE's Nuclear Waste Management program does not justify this confidence. Despite the growing evidence of its unsuitability, the Atomic Energy Commission continued to pursue the Lyons, Kansas site until Congress required that activities terminate until the project's safety could be certified, which cause the Commission to abandon the project. The WIPP project has undergone a series of transformations which finally forced the State Attorney General to sue the Department in order to force it to respond to some of the state's concern and we have just learned of serious leakage at the WIPP site. Congress was informed that although the design life of the carbon steel tanks at Hanford had been conservatively set at 50 years and that hot-cell tests indicated the carbon steel would corrode at the rate of only one ten-thousandth of an inch a month, giving the steel plates 300 years of integrity, in fact, the first leaks occurred after only 15 years and, to date, leaks from these tanks total more than 450,000 gallons—with one single leak totalling 115,000 gallons. Thus, the Department's past efforts constitute a record that warrants that an independent review of the Secretary's actions be provided.

From a legal standpoint, subjecting the Secretary's activities to the approval of the Commission would be consistent with the concept of federal preemption advanced in the Science and Technology Committee's bill. The principle of federal preemption is that the federal government has acted, leaving no room for state regulation. However, if the regulatory function is suspended, as it would be under H.R. 5016, and the Secretary is free to take whatever actions he deems appropriate without having a statutory responsibility to protect the public health and safety, then clearly the basis for the federal preemption in regard to the Secretary's site-specific activities becomes questionable, in that one of the essential ingredients is missing. Because of the general public concern and the national interest in nuclear safety, it would seem essential to subject the Secretary's activities to the approval of the Commission. This does not imply that in the case of the test and evaluation facility, the Secretary must submit to the formal licensing process. What is instead envisioned is an informal review of the Secretary's activities, subject to such procedures the Commission deems appropriate, with the Commission having the final authority in regard to public health and safety issues.

Many have argued that the real impediment to the establishment of a waste repository are institutional rather than technical. If the Congress fails to establish a system that promotes public confidence in the process, we have ultimately then failed to address one of the fundamental issues regarding the disposal of nuclear waste, and therefore we have done little to solve the problem. The substantive issue of assuring safety is, of course, paramount.

In confining its consideration of H.R. 5016 to just the research and development provisions, the Committee on Science and Technology has greatly increased the potential for this Congress to enact a comprehensive nuclear waste-management bill. Moreover, even in regard to the non-research and development portions, the sponsors of this legislation have taken positions which will facilitate the achievement of a compromise. While I cannot support the bill, and especially the non-research and development provisions, I do recognize and appreciate the efforts of the supporters of this legislation.

With respect to the licensing provision of the bill, there is however no simple justification for compromising public involvement in the licensing process, for limiting the scope of the issues considered in the licensing process or for seeking to curtail judicial review. There also is no need or justification for circumventing the requirements of the National Environmental Policy Act. I believe that it is important that this nation find a solution to the nuclear waste problem as quickly as possible, but it must be done consistent with the fullest protection of health and safety and in a manner fully open to the address of public, state and local concerns. Moreover, attempts to compromise or circumvent the licensing process only undermine public confidence in the program, and thus make no contribution towards solving the problem. Therefore, I intend to remain a strong defender of the process, and when H.R. 5016 reaches the Floor, I will offer amendments which will strengthen the role of the Nuclear Regulatory Commission and assure full public participation.

RICHARD L. OTTINGER.

DISSENTING VIEW OF CONGRESSMAN HOWARD WOLPE

I unfortunately find it necessary to dissent from the opinion of the majority of the Committee on this important legislation. Although I was also unable to support this bill when it was reported from the Energy Research and Production Subcommittee, I chose to vote "present" at that time, hoping that an acceptable compromise could be worked out in full Committee. Despite the sincere efforts of the Chairwoman of the Subcommittee and her staff, which I deeply appreciated, we were unable to reach such an agreement.

As I have often stated during the course of the debate on this issue, nuclear waste management policy should not divide the proponents and opponents of nuclear energy. Substantial quantities of nuclear waste have already accumulated from both civilian and military programs. Consequently, regardless of one's viewpoint on the future role of nuclear energy, we all share a common interest in moving as expeditiously as possible to identify the means to safely and permanently isolate these highly toxic materials from the biosphere.

Such an effort must clearly address the myriad technical questions posed by this problem and withstand the close scrutiny of the scientific community. I am convinced, however, that achieving a political consensus on a solution to this problem is equally important.

Individual citizens and state and local governments must have the opportunity to be actively involved in every stage of the development of a national nuclear waste disposal program. If we attempt to discourage full public participation, we will undermine and delay—not expedite—the development of a sound waste disposal program. We will only create the public perception that a questionable solution to a serious problem is being forced through to provide a boost to the troubled nuclear industry. We must make every effort to dispel this perception by assuring the American people that their concerns will be heard, and that the protection of the public welfare remains the primary responsibility and commitment of the federal government.

I cannot support this legislation because I am unconvinced that the following hypothetical questions from the American people can be satisfactorily answered by its provisions so as to assure the public confidence necessary for its successful implementation:

What is the purpose of the Test and Evaluation Facility? If there is a need to perform generic research and gain experience in the handling of nuclear waste, why can't these activities be performed at the existing Nevada Test Site? If site specific research is needed for the permanent repository, won't that already be required by the Nuclear Regulatory Commission as part of the site characterization activities needed to license the facility?

Why will the site for the Test and Evaluation Facility be chosen before the permanent site is chosen? As it is generally assumed that the two sites will be co-located, won't the rest of the site selection process for the permanent facility become meaningless?

If the two facilities are not co-located, could the Test and Evaluation facility be sited without the opportunity for the state to object and appeal to the Congress?

If a state were successful in petitioning Congress to block the siting of the permanent repository, would the Department of Energy have the authority to locate the Test and Evaluation facility at the same site notwithstanding the earlier Congressional action?

Is it possible that highly radioactive waste materials could be buried in a test facility that could be later found to be unlicensable for a permanent facility due to safety factors?

HOWARD WOLPE.

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[COMMITTEE PRINT]

DECEMBER 7, 1981

97TH CONGRESS
1ST SESSION

H. R. 5016

[Report No. 97-]

To establish a Federal policy with respect to the disposal of high-level radioactive waste from civilian nuclear activities, to provide for the construction, operation, and maintenance of waste disposal facilities, to provide for a program of nuclear waste and spent fuel research and development, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

NOVEMBER 18, 1981

Mrs. BOUQUARD (for herself, Mr. LUJAN, Mr. FUQUA, Mr. GOLDWATER, Mr. LUNDINE, Mr. WINN, Mr. ROE, Mr. WALKER, Mr. SCHEUER, Mr. CARNEY, Mr. WALGREN, Mr. GREGG, Mr. FLIPPO, Mr. SKEEN, Mr. YOUNG of Missouri, Mr. LOWERY of California, Mr. GORE, Mr. WHITE, Mr. VOLKMER, and Mr. RALPH M. HALL) introduced the following bill; which was referred jointly to the Committees on Energy and Commerce, Interior and Insular Affairs, Science and Technology, and Rules

DECEMBER , 1981

Reported from the Committee on Science and Technology, with amendments

[Omit the part struck through and insert the part printed in italic]

A BILL

To establish a Federal policy with respect to the disposal of high-level radioactive waste from civilian nuclear activities, to provide for the construction, operation, and maintenance of waste disposal facilities, to provide for a program of nuclear waste and spent fuel research and development, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "High-Level Radioactive Waste Management and Policy Act".

DEFINITIONS

SEC. 2. For purposes of this Act:

(1) The term "agency" or "Government agency" means any part of the executive branch of the United States, or any commission, branch, department, or bureau of the United States including, but not limited to, the Department of Energy, the Nuclear Regulatory Commission, the Environmental Protection Agency, and the Department of the Interior.

(2) The term "atomic energy defense ~~activities of the Secretary"~~ *activities*" includes those activities *of the Secretary* performed, in whole or in part, in carrying out the functions of—

(A) naval reactors development and propulsion,

(B) weapons activities, verification, and control technology,

(C) defense materials production,

(D) inertial confinement fusion,

(E) defense waste management, and

(F) defense nuclear materials, security, and safeguards,

all as included in the appropriations account of the Department in any fiscal year for such functions.

(3) The term "civilian nuclear activities" means those atomic energy activities not performed as atomic energy defense activities as defined by this Act; and includes, in part, Government agency, and nongovernment atomic energy research, development, and demonstration activities that are not such atomic energy defense activities, and nongovernment production of electricity by nuclear powerplants.

(4) The term "Commission" means the Nuclear Regulatory Commission.

(5) The term "Department" means the Department of Energy.

(6) The term "disposal" means the emplacement in a repository of high-level radioactive waste, ~~or~~ spent fuel, *or other highly radioactive material* with no foreseeable intent of recovery, whether or not such emplacement permits the recovery of such waste.

(7) The term "disposal package" or "package" means the primary container which holds and is in contact with solidified waste, spent fuel, or other radioac-

tive materials and any overpacks which are emplaced at the repository.

(8) The term "engineered barriers" means man-made components of the disposal system designed to prevent the release of radionuclides into the geologic media, and includes, among other things, the waste form, the waste canisters, and other materials to be placed over and around the waste canisters.

(9) The term "environmental impact statement" means any document prepared in compliance with section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)).

(10) The term "Governor" means the Governor of a State or his designee.

(11) The term "high-level radioactive waste" or "waste" means highly radioactive materials resulting from the reprocessing of spent fuel, including liquid waste produced directly in such reprocessing or any solid material into which such liquid waste is converted, *highly radioactive materials resulting from accidents at nuclear powerplants or other facilities used in civilian nuclear activities*, spent fuels designated by the Secretary to be unsuitable for technical reasons for reprocessing, transuranic waste, certain nonfuel materials activated by neutron bombardment as may be des-

ignated by the Secretary or the Commission, and such other highly radioactive material as the Secretary or the Commission shall designate as high-level radioactive waste.

(12) The term "Indian tribe" means an Indian tribe, as defined in section 4(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 540b(b)).

(13) The term "nuclear waste repository" or "repository" means (except as provided in section 4 of this Act) any facility for the deep geologic disposal of the solid forms of high-level radioactive waste, spent fuel, or any combination of such materials, whether or not such facility is designated to permit the subsequent recovery of the materials placed in the repository.

(14) The term "reservation" means—

(A) the Indian reservations and dependent Indian communities referred to in clauses (a) and (b) of section 1151 of title 18, United States Code; and

(B) lands selected by Alaska Native villages or regional corporations under the provisions of the Alaska Native Claims Settlement Act.

(15) The term "Secretary" means the Secretary of Energy.

(16) The term "site characterization" means activities including borings, surface excavations, shaft excavations, subsurface lateral excavations and borings, and in situ testing to determine the suitability of a site for a test and evaluation facility or a repository or both, but does not include preliminary borings and geophysical testing needed to decide whether site characterization should be undertaken.

(17) The term "solidified waste" means high-level radioactive waste which has been processed to produce a solid form that meets the requirements for transportation and permanent disposal promulgated pursuant to this Act or other Acts of Congress.

(18) The term "spent fuel" means nuclear fuel that has been irradiated in, and recovered from, a civilian nuclear powerplant or other civilian nuclear activities and which has not undergone reprocessing to separate constituent elements.

(19) The term "State" means any State of the United States, the District of Columbia, and, subject to the provisions of the Act of March 12, 1980 (94 Stat. 84), the Commonwealth of Puerto Rico, the Virgin Islands, Guam, the Northern Mariana Islands, the Trust Territory of the Pacific Islands, and any other territory or possession of the United States.

(20) The term "Test and Evaluation Facility" or "demonstration facility" means an at-depth, prototypic, underground cavity with subsurface lateral excavations, extending from a central shaft, which is used for research and development purposes, including the development of data, and experience for the safe handling and disposal of solidified waste or spent fuel.

(21) The term "transuranic waste" means material containing elements which have an atomic number greater than ninety-two, including neptunium, plutonium, americium, and curium, which have a half-life greater than five years, and which are in concentrations of greater than ~~ten~~ *one hundred* nanocuries per gram or in such other concentrations as the Commission may determine.

(22) The term "tribal council" means the governing body of an Indian tribe or tribes.

FINDINGS AND PURPOSES

SEC. 3. (a) FINDINGS.—The Congress finds that—

(1) spent fuel from nuclear power reactors and wastes from the commercial industry are accumulating rapidly and may create a national problem;

(2) State and public participation in the planning and development of repositories for the disposal of high-level radioactive waste and spent fuel is essential

in order to promote public confidence in methods for the safe disposal of such waste and spent fuel;

(3) the technology exists to provide reasonable assurance that high-level radioactive waste and spent fuel can be safely disposed of and that disposal facilities for high-level wastes and spent fuel can be made available when needed; and

(4) it is in the national interest to resolve issues relating to the nuclear fuel cycle because—

(A) a reliable system adequate to provide sufficient electrical energy to meet the Nation's current and anticipated needs is an essential part of both interstate commerce and comprehensive national energy policy and is vital to the national security and public welfare; and

(B) an adequate electrical system requires a diversified base of primary energy sources in order to avoid excessive reliance upon any single alternative energy source.

(b) PURPOSE.—It is the purpose of this Act—

(1) to establish the Federal policy and the responsibilities for the disposal of high-level radioactive waste and spent fuel from civilian nuclear activities;

(2) to accelerate and provide direction to the Secretary in regard to the disposal of high-level radioactive waste and spent fuel; and

(3) to authorize the Secretary—

(A) to provide for the construction, operation, and maintenance of deep geologic waste disposal facilities; and

(B) to provide for a focused and integrated nuclear waste and spent fuel research and development program, including the development of a Test and Evaluation Facility to carry out research and provide an integrated demonstration of the technology for deep geologic disposal of waste, and the development of the facilities to demonstrate dry storage of spent fuel;

(4) to provide the Secretary with contracting authority to collect, in advance, from the users of nuclear technology, the costs of carrying out this Act;

(5) to provide for an improved cooperative role between the Federal Government and States, localities, and Indian tribes in the siting of facilities for the disposal of waste and spent fuel; and

(6) to provide technical and financial assistance to States, localities, and Indian tribes to foster the development and implementation of programs to prevent and

mitigate any adverse economic, social, or environmental impacts resulting from construction and operation of repositories.

APPLICATION

SEC. 4. The provisions of this Act shall not apply to the siting, construction, or operation of repositories which are used exclusively for the disposal of high-level radioactive waste, low-level radioactive waste, or spent fuel resulting from the atomic energy defense activities of the Secretary.

MISSION PLAN

SEC. 5. (a) The Secretary shall prepare a comprehensive report, to be known as the mission plan, which shall provide an informational basis sufficient to permit informed decisions to be made in carrying out the repository program and the research, development, and demonstration programs required under this Act. The mission plan shall include—

(1) an identification of the primary scientific, engineering, and technical information, including any necessary demonstration of engineering or of systems integration, that should be available, and that must be available, before responsible determinations can be made with respect to the siting and construction of a Test and Evaluation Facility and repositories;

(2) an identification of which information referred to under ~~subparagraph~~ *paragraph* (1) is not available

because of any unresolved scientific, engineering, or technical questions, or undemonstrated engineering or systems integration; a schedule including specific major milestones for the research, development, and technology demonstration program required under this Act and any additional activities to be undertaken to provide such information; a schedule for the activities necessary to achieve important programmatic milestones; and an estimate of the costs required to carry out such research, development, and demonstration programs;

(3) an evaluation of financial, political, legal, or institutional problems which might impede the implementation of this Act, the Secretary's plan to resolve these problems, and recommendations for any necessary legislation to resolve them; and

(4) a discussion by the Secretary regarding the advisability and technical necessity for proceeding with additional test and evaluation facilities at sites other than the one selected pursuant to section 11 and any comments of the Secretary on the program and purpose of the Test and Evaluation Facility required under section 11; and in the case where the Secretary has identified the development of any such additional facilities—

(A) the reasons that the Secretary considers such development to be appropriate (including information determined to be necessary under paragraph ~~(1)(B)~~ *(2)* which the Secretary seeks to obtain);

(B) the designation of potential sites for any such facilities; and

(C) the period of time during which any such facilities would operate, the date at which waste or spent fuel stored at such facilities would be removed, and the sites to which such waste or fuel would be moved.

(5) a discussion of the significant results of research and development programs conducted and the implications for each of the different geologic media under consideration for the siting of repositories, and, on the basis of such information, a comparison of the advantages and disadvantages associated with the use of such media for repository sites; and

(6) the guidelines issued pursuant to ~~subsection~~ *section* 6(b) provided that the guidelines shall become effective pursuant to section 6 notwithstanding subsections (b) and (c) of this section.

(7) A description of the known sites at which ~~site characterization~~ *siting research* activities should be un-

dertaken; a description of the ~~site characterization~~ *siting research* activities, including the extent of planned excavations, plans for onsite testing with radioactive or nonradioactive material, plans for any investigation activities which may affect the capability of the site to isolate wastes or spent fuel, and plans to control any adverse, safety-related impacts from ~~site characterization~~ *siting research* activities; plans for decontaminating and decommissioning of the site if it is determined unsuitable for licensing as a repository.

(8) An identification of the process for solidifying waste or packaging spent fuel, including a summary and analysis of the data to support the selection of the solidification process and packaging techniques; an analysis of the requirements for the number of solidification and packaging facilities needed; a description of the state of art for the materials proposed to be used in packaging the wastes or spent fuel and the availability of the materials including impacts on strategic supplies and any requirements for new or reactivated facilities to produce the needed materials; and a description of a plan, and the schedule for implementing the plan, for an aggressive research and development program to provide when needed a high-integrity disposal package at a reasonable price.

(9) An estimate of (A) the total repository capacity required to safely accommodate the disposal of all radioactive waste and spent ~~nuclear~~ fuel generated through the year 2020 in the event that no commercial reprocessing of spent fuel occurs, as well as the repository capacity which would be so required if such reprocessing did occur, (B) the number and type of repositories required to be constructed to provide such disposal capacity, (C) a schedule for the construction of such repositories, and (D) an estimate of the period during which each repository listed in the schedule would be in operation filled to its maximum extent.

(10) An estimate of the costs required (A) to construct and operate the repositories anticipated to be needed under paragraph ~~(8)~~ *(9)* based on each of the assumptions referred to in such paragraph, (B) to construct and operate a Test and Evaluation Facility or facilities determined to be necessary (other than such repositories included under clause (A)), and (C) to carry out any other activities under this Act.

(11) An identification of the possible adverse economic and other impacts to the State or tribe involved which may arise from the development of a Test and Evaluation Facility, or repository, at a site.

(b)(1) Not later than fifteen months after the date of the enactment of this Act, the Secretary shall submit a draft mission plan to the States, *the Indian tribes*, the ~~Nuclear Regulatory~~ Commission, and other Government agencies *as* the Secretary deems appropriate for their comments.

(2) In preparing any comments on the mission plan, such agencies shall specify with precision any objections that they may have. Upon submission of the mission plan to such agencies, the Secretary shall publish a notice in the Federal Register of the submission of the plan and of its availability for public inspection, and, upon receipt of any comments of such agencies respecting the plan, the Secretary shall publish a notice in the Federal Register of the receipt of comments and of the availability of the comments for public inspection. If the Secretary does not revise the plan to meet objections specified in the comments, the Secretary shall publish in the Federal Register a detailed statement for not so revising the plan.

(3) The Secretary, after reviewing any other comments made by such agencies and revising the plan to the extent that the Secretary may consider to be appropriate, shall submit the mission plan to the appropriate committees of the Congress not later than seventeen months after the date of the enactment of this Act. The mission plan shall be effective at the end of the first period of thirty calendar days (not

including any day on which either House of Congress is not in session because of adjournment of more than three calendar days to a day certain) after the date of transmittal of the plan.

(c)(1) Every year after the mission plan first takes effect under this section, the Secretary shall submit to the Congress a report describing in detail the progress made toward implementation of the plan. The report shall include any revisions or amendment to the mission plan which the Secretary considers appropriate to accomplish the purposes of this Act.

(2) Any amendment to an approved mission plan shall be submitted to the Congress, either in a report under paragraph (1) or at such other time as the Secretary considers appropriate, and the amendment shall become effective in the same manner as provided under paragraph (1).

IDENTIFICATION OF SITES ~~FOR WASTE REPOSITORIES~~

SEC. 6. (a) PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT.—Within twelve months after the date of enactment of this Act, the Secretary shall complete a final programmatic environmental impact statement (pursuant to the National Environmental Policy Act of ~~1974,~~ *1969,* and consistent with this Act) on the management of radioactive waste and spent fuel generated through civilian nuclear activities.

(b) Guidelines.—Not later than six months after the date of the enactment of this Act and notwithstanding the failure of other agencies to promulgate standards pursuant to applicable law, the Secretary shall, in consultation with the Commission, the United States Geological Survey, the Environmental Protection Agency, the Council on Environmental Quality, and such other Government agencies as the Secretary considers appropriate, issue (pursuant to subchapter II of chapter 5 of title 5, United States Code) general guidelines for the selection of sites for repositories. Under such guidelines the Secretary shall specify factors that would qualify or disqualify a site for development as a repository, including factors pertaining to the location of valuable natural resources, proximity to populations, hydrogeophysics, seismic activity, and nuclear defense activities. The guidelines shall require the Secretary to consider the various geologic media in which sites for repositories may be located and, to the extent practicable, to identify sites in different geologic media. The Secretary shall use guidelines established under this subsection in considering and selecting sites pursuant to this Act.

(c) Site Identification by the Secretary.—Not later than one year after the date of the enactment of this Act, and subsequent to promulgation of guidelines pursuant to subsection ~~(a)~~ *(b)*, the Secretary shall identify three or more sites, at least two of which shall be in different geologic media in the continental United States, and at least one of which shall be in media other than salt. Subject to Commission requirements, the Secretary shall give preference to sites for the initial repository in media possessing geochemical characteristics which retard aqueous transport of radionuclides. In order to provide a greater possible protection of public health and safety as operating experience is gained at the initial repository, and with the exception of the primary candidate sites as presently named by the Secretary, all sites identified under ~~section 6(a)~~ *this subsection* shall be more than fifteen statute miles from towns having a population of greater than one thousand persons as determined by the most recent census unless such sites contain high level radioactive waste prior to identification under this Act. Each site identified shall be supported by a detailed statement of the basis for the identification. When the Secretary identifies a site, the Secretary shall as soon as possible notify the Governor of the State in which the site is located, or the tribal council of any Indian tribe on whose reservation the site is located, of such identification and the basis therefor. Additional sites may be identified after the one year period, following the same procedure as if such sites had been identified within that period.

SITING RESEARCH AND RELATED ACTIVITIES

SEC. 7. (a) IN GENERAL.—Within forty-two months after the date on which the Secretary identifies the sites pursuant to ~~subsection 6(b)~~ *section 6(c),* the Secretary shall ~~in consultation with~~, *with the concurrence of* the Commission complete, at no fewer than three identified sites such siting research activities, including site characterization activities, as may be necessary to prepare the required environmental reports and to evaluate the suitability of a site for a repository~~: *Provided,* That three sites shall be sufficiently evaluated, within thirty months after the date on which the sites are identified, to permit the Secretary to select a site for the expanded siting research activities and for other activities both pursuant to section 11.~~ *Within thirty months of such date the Secretary shall have sufficiently evaluated three sites to select a site for the expanded siting research activities and for other activities pursuant to section 11.* The Secretary shall conduct such preconstruction activities relative to such site selection for the Test and Evaluation Facility as he deems ~~appropriate: *Provided, however,* That facilities~~ *appropriate. Facilities* exclusively used for the Test and Evaluation Facility shall not be constructed on ~~such~~ *any* site prior to the effective date of the initial repository site selection or rejection. Additional sites may be evaluated after the forty-two month period, following the same procedures as if such sites were to be evaluated within that period.

(b) PUBLIC MEETINGS AND ENVIRONMENTAL ASSESSMENT.—Within six months after identifying the sites pursuant to ~~subsection~~ *section* 6(c) and before beginning ~~site characterization~~ *siting research* activities, the Secretary shall—

(1) hold at least one public meeting in the vicinity of each site to inform the residents of the area of the activities to be conducted at the site and to receive their views; and

(2) prepare an environmental assessment, in implementing the National Environmental Policy Act of 1969, of the nonradiological impacts of the ~~site characterization~~ *siting research* activities planned for such site and discuss, in such assessment, the alternative ~~site characterization~~ *siting research* activities which may be undertaken to avoid such impacts.

(c) RESTRICTIONS.—Except as provided in section 11 with respect to the Test and Evaluation Facility, in conducting ~~site characterization~~ *siting research* activities or tests for the repository pursuant to subsection ~~(b)~~ *(a)*—

(1) the Secretary shall use the minimum quantity of waste or other radioactive materials, if any, necessary to achieve the test or research objectives;

(2) the Secretary shall ensure~~, to the maximum extent practical,~~ that any radioactive material used or placed on a site shall be fully retrievable; and

(3) upon termination of ~~site characterization~~ *siting research* activities at a site for any reason, the Secretary shall remove any radioactive material at or in the site as promptly as practicable.

REPOSITORY SITE SELECTION

SEC. 8. (a) HEARINGS AND SECRETARIAL DECISIONS.—(1) Before selecting a site for a repository and within three months after completion of ~~the site characterization,~~ *siting research activities,* the Secretary shall hold at least one legislative-type public hearing in the vicinity of the site that the Secretary intends to select to inform the residents of the area in which the site is located of the preliminary determination of the Secretary and to receive their comments. Upon completion of the hearing process, if the Secretary determines to select that site for a repository, the Secretary shall immediately notify the Governor of the State in which such proposed repository would be located or the appropriate tribal council of his decision, and a Repository Development Report as required under section 9(b) shall be submitted to Congress by the President.

(2) If the Secretary's selection of a site for a repository does not take effect because of disapproval by the President

or the Congress under section 9, the President shall submit to the Congress within twelve months after such disapproval a Repository Development Report for another site as selected by the Secretary for a repository.

(b) SUBMISSION OF APPLICATION.—(1) If the Secretary's selection of a site for a repository is not disapproved by the President or the Congress under section 9, the Secretary shall—

(A) submit to the Commission, within thirty days after the date on which the selection of the site becomes effective under section 9, a license application for a repository at such site; and

(B) provide the Governor of the State in which the site is located, or the tribal council of any Indian tribe on whose reservation the site is located, a copy of the application.

(2) The Commission shall consider the application (including amendments thereto) only on the basis of those considerations set forth in the Atomic Energy Act of 1954.

(c) LICENSING STATUS REPORT.—No later than twenty-four months after the date on which an application for a license is submitted under subsection (b), and annually thereafter until the date on which an operating license is issued, the Commission shall submit a report to the Congress describing the proceedings undertaken through such date with regard to such application, including a description of—

(1) any major unresolved safety issues and the Secretary's explanation of design and operation plans for resolving such issues;

(2) any matters of contention regarding the application; and

(3) any Commission actions regarding approval or disapproval of the application or the operating license.

The Secretary shall cooperate with the Commission in supplying information necessary for the report.

(d) REPOSITORY LICENSING AND CONSTRUCTION.—(1) The Commission shall consider an application (including amendments thereto) for a license for all or part of a repository in accordance with this Act the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, except that the Commission shall make a final decision approving or disapproving the issuance of construction authorization not later than twenty-four months after the date of the submission of the application: *Provided,* That the Commission, with the Secretary's concurrence, may extend the period for making such final decision by up to twelve additional months if, within thirty days after the expiration of the twenty-four-month period, it finds that such decision can probably be made within such twelve additional months and that the issuance of a construction authorization is more probable than not, and if it complies with the reporting requirements relative to a delay in the project decision schedule under subsection 10(c). If the Commission disapproves an application, the Secretary shall select another site in compliance with section 8 as soon as possible. Prior to receiving a license application, the Commission shall, to the maximum extent practical, keep itself fully and currently informed about the activities of the Department that are pertinent to the licensing process and conduct any activities that may help the Commission to minimize the time needed to consider the potential application. Consistent with the Department of Energy Organization Act (Public Law 95-91), the Secretary shall cooperate with the Commission and provide the Commission with the necessary information to keep it fully and currently informed.

(2) Notwithstanding any other provision of law to the contrary, in any Commission hearing pursuant to the Atomic Energy Act of 1954 on an application for a construction authorization or a license relating to a repository (or any amendment to such a license), the Commission shall first provide the parties to the proceeding with an opportunity to submit for the record such written data, views, or arguments as the hearing board may specify. At the request of any party, the hearing board shall provide an opportunity for oral argument with respect to any matter which the hearing board

determines to be in controversy among the parties. The hearing shall be preceded by such discovery procedures as the rules of the Commission shall provide, and as ordered by the hearing board. The hearing board shall require each moving party, including the Commission staff, to submit in written form, at the time the proceeding is initiated, a summary of the facts and arguments upon which that party proposes to rely unless the board finds that such requirement will unduly dalay the proceeding.

(3)(A) At the conclusion of any hearing under paragraph (2), the hearing board shall designate any disputed question of fact, together with any remaining questions of law, for resolution in an adjudicatory hearing only if it determines that—

(i) there is a genuine and substantial dispute of fact involving factual assumptions or methodology upon which expert opinion is based, or concerning the credibility or competence of an expert witness significantly relied upon by one or more of the parties to the proceeding, which can only be resolved with sufficient accuracy by the introduction of reliable and specifically identified evidence in an adjudicatory hearing;

(ii) such dispute involves a technical matter affecting the public health and safety of construction, operation, decommissioning, or long-term postoperational performance of the facility which is the subject of the hearing; and

(iii) the decision of the Commission is likely to depend in whole or in part on the resolution of such dispute.

(B) In making a determination under this paragraph, the hearing board shall designate in writing the specific facts that are in genuine and substantial dispute, the reason why the decision of the agency is likely to depend on the resolution of such facts, and the reason why an adjudicatory hearing is likely to resolve the dispute.

(4) No court shall hold unlawful or set aside a decision of the Commission in any proceeding described in paragraph (2) or (3) because of a failure by it to use a particular procedure pursuant to this section unless—

(A) an objection to the procedure used was presented to the hearing board in a timely fashion or there are extraordinary circumstances that excuse the failure to present a timely objection, and

(B) the court finds that such failure has precluded a fair consideration and informed resolution of a central issue of the proceeding taken as a whole.

(5) No member of a hearing board in a proceeding pursuant to this subsection on an application for a construction authorization may raise for consideration in such hearing an

issue not put in contention by a party to the hearing, except that the Commission, on its own motion, may direct the hearing board to raise in such hearing any matter, whether or not put in contention by any party, whose resolution it believes may be essential to the hearing board's decision in the proceeding. No member of a hearing board in any other proceeding pursuant to this subsection may raise for consideration in such hearing an issue not put in contention by a party to the hearing, except in extraordinary circumstances, or except that the Commission, on its own motion, may direct the hearing board to raise in such hearing any matter, whether or not put in contention by any party, whose resolution it believes may be essential to the hearing board's decision in the proceeding.

(6) In any Commission hearing on such an application, the Commission shall not admit or consider any contentions by any party (with the exception of the Governor of the State in which the repository site is located, or the tribal council of the Indian tribe on whose reservation the site is located) in public proceedings unless the party offering the contention supports it with substantial and specific facts, not in the nature of conclusory allegations, supported by affidavits of persons having knowledge of the facts therein.

(7) Within 6 years after the date on which the Secretary obtains a construction authorization from the Commission pursuant to subsection (b)—

(A) the Secretary (subject to such terms and conditions as the Commission may require pursuant to the Atomic Energy Act of 1954) shall complete construction of surface facilities and such subsurface excavations and facilities as are needed to initiate emplacement of wastes;

(B) the Secretary shall operate the repository at the earliest practical date after receiving a license from the Commission; and

(C) the Commission shall approve or disapprove the issuance to the Secretary of a license relating to all or part of a repository under such terms and conditions as may be specified by the Commission to protect the public health and safety. Any hearings held pursuant to the Atomic Energy Act of 1954 prior to the issuance of a license (including amendments thereto) to operate the repository shall be limited to health and safety issues not decided at the construction authorization stage.

(8) To the fullest extent permitted by law, the Secretary and any officer or employee of a Government agency to which this Act applies may provide information to the Com-

mission and consult with the Commission at any time and in any manner requested by the Commission.

(9) The Commission shall consider a license application (including amendments thereto) relating to a repository in accordance with the laws applicable to such applications, except as otherwise provided in this Act; and except that the environmental impact statement prepared by the Secretary, and concurred with by the Commission pursuant to section 9(b), with respect to the site for any repository, shall be deemed to also satisfy the Commission's responsibilities under the National Environmental Policy Act of 1969 with respect to that repository (including but not limited to consideration of alternative sites).

(10)(A) Any time after filing an application with the Commission for a license relating to a repository (or for any amendment to such a license), the Secretary may submit a petition to the Commission for issuance of a construction authorization, license or license amendment on an interim basis prior to the conduct or completion of any required hearing upon such application.

(B) The Commission shall grant the petition submitted under subparagraph (A) and issue the construction authorization, license or license amendment on an interim basis if the Commission or its designee determines that—

(i) in all respects other than the conduct or completion of any required hearing, the requirements of law are met; and

(ii) in accordance with such requirements, there is reasonable assurance that the activities authorized by the construction authorization, license or license amendment during the interim period, in accordance with the terms and conditions of such construction authorization, license or license amendment, will provide adequate protection to the public health and safety. There shall be no disposal of waste or spent fuel in the repository for which such interim license has been issued until such time as the regular license to receive and possess waste in the repository is issued.

(11) Notwithstanding any failure of the Environmental Protection Agency to promulgate standards pursuant to subsection 10(b), within 6 months after the date of the enactment of this Act the Commission shall promulgate its rules and criteria to apply in reviewing license applications (including amendments thereto) for the construction and operation of repositories.

(12) The Secretary may take title at the repository, in the name of the Government, to the waste, spent fuel, or other radioactive material emplaced in the repository.

REPOSITORY SITING REVIEW AND REPORTS

SEC. 9. (a) CONSULTATION AND CONCURRENCE.—(1) The State or any tribal council notified of a site identification under subsection 6(c) shall have the right to participate in a process of consultation and concurrence as soon as the site has been identified pursuant to such section and throughout the life of the repository involved. For purposes of this section, the term "process of consultation and concurrence" means a methodology—

(A) by which the Secretary—

(i) keeps the Governor or tribal council where appropriate, fully and currently informed about any potential economic or public health and safety impacts in all stages of the siting, development, construction, and operation of a repository;

(ii) solicits, receives, and evaluates concerns and objections of the Governor or the tribal council with regard to the repository on an ongoing basis; and

(iii) works diligently and cooperatively to resolve such concerns and objections; and

(B) by which the State can exercise reasonable independent monitoring and testing of on-site activities related to all stages of the siting, development, construction and operation of the repository: *Provided,* That any such monitoring and testing shall not unreasonably interfere with on-site activities.

(2) The Secretary may enter into written agreements with the Governor of the State in which an identified site is located or with the tribal council of any Indian tribe on whose reservation an identified site is located in order to expedite the consultation and concurrence process. Any such written agreement shall specify—

(A) procedures by which the State or tribal council may study, determine, comment on, and make recommendations with regard to the possible health, safety, and economic impacts of the repository involved;

(B) procedures by which the Secretary may consider and respond to comments and recommendations made by the State or tribal council, including the period in which the Secretary may so respond;

(C) the documents the Department is to submit to the State or tribal council, the timing for such submissions, the timing for the State or tribal council to identify public health and safety concerns and the process to be followed to try to eliminate those concerns;

(D) procedures by which the Secretary and either the State or the tribal council may review or modify the agreement periodically; and

(E) procedures for public notification of the procedures specified under subparagraphs (A) through (D).

(3) Except as specifically provided herein, nothing in this Act is intended to grant any State or Indian tribe any authority with respect to the siting, development, or loading of any repository.

(b) REPOSITORY DEVELOPMENT REPORTS.—The Secretary shall complete a Repository Development Report and submit it to the President within 6 months after completing the hearing process required under subsection 8(a). The Repository Development Report shall contain—

(1) an environmental impact statement for the site, prepared with the concurrence of the Commission on the intended scope, outline, and alternatives to be considered;

(2) the views and comments of—

(A) the Governor of the State in which the repository site is located and the tribal council of any Indian tribe on whose land the site is located;

(B) the Governor of any other interested State that may be directly and substantially affected by a repository at the proposed site;

(C) the public;

(D) such other Federal agencies as the Secretary considers appropriate; and

(E) the Secretary, in response to any views and comments pursuant to this section;

(3) a license application for the repository prepared by the Secretary for submission to the Commission; and

(4) a plan for the transport of spent fuel and high-level radioactive or transuranic waste to the repository.

(c) PRESIDENTIAL REVIEW OF SITES.—(1) Within thirty days after the submission of the Repository Development Report, the President shall either approve the site and transmit notice of the approval and the report to the Congress, or disapprove the site and submit notice of the disapproval to the Congress.

(2) The selection of a site for a repository shall be effective at the end of the thirty-day period beginning on the date that the President transmits notice of his approval of such site to the Congress under paragraph (1) unless the Governor of the State in which the site is located has submitted to the Congress a petition for disapproval, or, where appropriate, the tribal council of an Indian tribe on whose reservation the site is located has submitted such a petition. If any such petition has been submitted, the selection of the site shall not be effective except as provided under subsection (d).

(3) If either House or both Houses are not in session on the day the President's notice of approval of a site and the

Repository Development Report are received by the appropriate officers of each House, such Repository Development Report shall be deemed to have been transmitted on the first succeeding day on which both Houses are in session.

(d) Congressional Review of Sites.—(1) If the President transmits notice of his approval to the Congress under subsection (c) and either the Governor of the State or the tribal council submits to the Congress a petition for disapproval under subsection (b), the selection of such site for the repository involved shall be effective at the end of the first period of forty calendar days of continuous session of the Congress after the date of the transmittal of such petition by the Governor or tribal council unless, during such period, either House of the Congress passes a resolution the matter after the resolving clause of which reads as follows: "That the approves the petition submitted by regarding the disapproval of the site at for a repository." (with the first blank space being filled with the designation of the appropriate House of the Congress, the second blank space being filled with the name of the Governor or the Indian tribe whose petition is approved, and the third blank being filled with the geographic location of the proposed repository site). For purposes of paragraphs (3) through (8) of this subsection, the term "resolution" means a resolution described by this paragraph.

(2) Paragraphs (3) through (8) of this subsection are enacted by the Congress—

(A) as an exercise of the rulemaking power of the Senate and the House of Representatives, respectively, and as such are deemed a part of the rules of each House, respectively, but applicable only with respect to the procedure to be followed in that House in the case of resolutions described by paragraph (1) of this subsection; and the provisions of such paragraphs supersede other rules only to the extent that they are inconsistent therewith; and

(B) with full recognition of the constitutional right of either House to change the rules (so far as relating to the procedure of that House) at any time, in the same manner and to the same extent as in the case of any other rule of the House.

(3) A resolution once introduced with respect to any site selection shall immediately be referred to the committee or committees of jurisdiction (and all resolutions with respect to the same site selection shall be referred to the same committee or committees) by the President of the Senate or the Speaker of the House of Representatives, as the case may be.

(4) If any committee to which a resolution with respect to a site selection has been referred has not reported it at the end of twenty calendar days after its referral, such committee shall be automatically discharged from further consideration of such resolution.

(5)(A) When all committees to which the resolution was referred have reported, or have been discharged from further consideration of, a resolution, it shall be at any time thereafter in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(B) Debate on the resolution referred to in subparagraph (A) shall be limited to not more than four hours, which shall be divided equally between those favoring and those opposing the resolution. A motion further to limit debate shall not be debatable. An amendment to, or motion to recommit, the resolution shall not be in order, and it shall not be in order to move to reconsider the vote by which the resolution was agreed to or disagreed to.

(6)(A) Motions to postpone, made with respect to the consideration of a resolution, and motions to proceed to the consideration of other business, shall be decided without debate.

(B) Appeals from the decision of the Chair relating to the application of the rules of the Senate or the House of Representatives, as the case may be, to the procedure relating to a resolution shall be decided without debate.

(7) Notwithstanding any of the provisions of this subsection, if either House has approved a resolution with respect to a site selection, then it shall not be in order to consider in that House any other resolution with respect to the same site selection.

(8) For the purpose of this subsection—

(A) continuity of session is broken only by an adjournment of the Congress sine die; and

(B) the days on which either House is not in session because of an adjournment of more than three days to a day certain are excluded in the computation of any period of time in which Congress is in continuous session.

GOVERNMENT AGENCY ACTIONS

SEC. 10. (a) GENERAL.—(1) Government agencies shall assist the Secretary by cooperating and coordinating with the Secretary in the preparation of any necessary reports, including the Mission Plan, the Repository Development Report, and the Project Decision Schedule.

(2) No action of the Secretary or any other Government agency required by this Act to be taken prior to the effective date of the selection of a repository site shall be considered to be a major Federal action for purposes of the National Environmental Policy Act of 1969, or shall require the preparation of environmental impact statements, except when otherwise specifically provided for in this Act.

(3) The Secretary and the heads of all other Government agencies shall, to the maximum extent possible, avoid duplication of efforts in the preparation of reports pursuant to the National Environmental Policy Act of 1969.

(b) ENVIRONMENTAL PROTECTION AGENCY.—Within four months after the date of the enactment of this Act, the Administrator of the Environmental Protection Agency shall, by rule, promulgate generally applicable standards for protection of the environment from radioactive material in repositories required pursuant to Reorganization Plan Numbered 3 of 1970.

(c) PROJECT DECISION SCHEDULE.—(1) The Secretary shall prepare and update, as appropriate, in cooperation with all concerned Government agencies, a Project Decision Schedule that portrays the optimum way to attain the operation of the repository involved, within the time periods specified in this Act. It shall include a sequence of events for all agencies required to take action, including an identification of the activities in which a delay in the start, or completion, of such activities will cause a delay in beginning repository operation.

(2) Notwithstanding any other provision of Federal law, the Project Decision Schedule shall constitute the lawful decisionmaking deadlines for the agencies concerned. Any Government agency that determines that it cannot comply with the schedule, or fails to so comply, shall submit to the Secretary and to Congress a written report explaining the reason for its failure or expected failure to meet the deadline, the reason why the agency could not reach an agreement with the Secretary, the estimated time for completion of the activity or activities involved, the associated effect on its other deadlines in the Project Decision Schedule, any recommendations it may have or actions it intends to take regarding any improvements in its operation or organization, or changes to its statutory directives or authority so that it will be able to mitigate the delay. The Secretary, within thirty days after receiving such report, shall file with the Congress its response to the agency's report, including the reasons why the Secretary could not amend the Project Decision Schedule to accommodate the agency.

RESEARCH AND DEVELOPMENT ON WASTE DISPOSAL

SEC. 11. (a) PURPOSE.—Within sixty-four months after the date of the enactment of this Act as part of and as an extension of the siting research activities at these sites conducted pursuant to ~~subsection~~ *section* 7(a) and subsequent to the effective date of the initial repository site selection or rejection), the Secretary shall begin the mining and construction, at a site evaluated pursuant to section 7, of a Test and Evaluation Facility for the following purposes:

(1) to supplement and focus the repository ~~site characterization process~~ *siting research activities* at the most promising site under consideration for a repository;

(2) to provide the conditions under which known technological components can be integrated to demonstrate a functioning repository-like system;

(3) to provide a vehicle for focusing attention on, for evaluating, and for resolution of potential licensing issues which could not be resolved during the siting research program pursuant to ~~subsection~~ *section* 7(a);

(4) to validate, under actual conditions, the scientific models used in the design of the repository;

(5) to refine the design and engineering of repository components and systems and to confirm the predicted behavior of such components and systems;

(6) to supplement the siting data, the generic and specific geological characteristics developed pursuant to

section 7 relative to isolating disposal materials in the physical environment of a repository.

(7) to evaluate the design concepts for packaging, handling, and emplacement of waste and spent fuel at the design rate; and

(8) to establish operating capability without excessive worker radiation dose.

(b) DESIGN.—The Secretary shall design the Test and Evaluation Facility—

(1) with a capacity for receiving a minimum of forty, and a maximum of three hundred, full-sized canisters of solidified waste; except that, if such waste cannot be obtained under reasonable conditions, spent fuel may be used instead of solidified waste;

(2) for full retrievability of solidified wastes, or other radioactive material used by the Secretary for testing, upon completion of the technology demonstration activities; and

(3) based upon the principle that the waste, spent fuel, or other radioactive material shall be isolated from the biosphere in such a way that the initial isolation is provided by engineered barriers functioning as a system with the geologic environment.

(c) OPERATION.—Within eighty-eight months after the date of the enactment of this Act, the Secretary shall begin the in situ testing program in accordance with the Mission Plan developed pursuant to section 5, in which he shall—

(1) conduct in situ tests of bore hole sealing, geologic media fracture sealing, and room closure to establish the techniques and performance for isolation of the waste, spent fuel, or radioactive materials from the biosphere;

(2) conduct in situ tests with radioactive sources and materials to evaluate and improve reliable models for radionuclide migration, absorption, and containment within the engineered barriers and the geologic ~~media:~~ ~~*Provided,* That such tests shall only be conducted if~~ *media, if* the Secretary believes there is reasonable assurance that the radioactive sources *and materials* will not threaten the use of the site as a repository;

(3) conduct in situ tests to evaluate and improve models for ground water or brine flow through fractured geologic media;

(4) conduct in situ tests under conditions representing the real time and the accelerated time behavior of the engineered barriers within the geologic environment;

(5) conduct in situ tests to evaluate the effects of heat and pressure on the geologic media, on the hy-

drology of the surrounding area, and on the integrity of the disposal packages;

(6) conduct in situ tests under both normal and abnormal repository conditions to establish safe design limits for disposal packages and *to determine the effects of the* gross release of radionuclides into surroundings, and the effects of various credible failure modes, including but not limited to—

(A) seismic events leading to the coupling of aquifers through the Facility;

(B) thermal pulses significantly greater than the maximum calculated; and

(C) human intrusion creating a direct pathway to the biosphere; and

(7) conduct such other research and development activities as the Secretary considers appropriate, including *such steps necessary to obtain the* use of waste, spent fuel, or other radioactive materials *(such as, any highly radioactive material from the Three Mile Island nuclear powerplant, or from the West Valley Demonstration Project authorized under Public Law 96–368)* for test and evaluation purposes, ~~provided~~ *if* such other activities are reasonably necessary to support the repository program and *if* there is reasonable assurance that the radioactive sources will not threaten the use of

the site as a repository. *Such in situ testing as authorized in this section shall be designed so as not to compromise the ability of the site to be licensed by the Commission for the operation of a permanent repository.*

(d) The Secretary ~~may~~ *shall, during the conduct of siting research activities pursuant to section 7* also use existing Department facilities for the conduct of generically applicable tests on the packaging, handling, and emplacement technology for solidified high-level radioactive waste and spent fuel from civilian nuclear activities during ~~site characterization~~ *the conduct of siting research* and for as long as the Secretary deems appropriate.

(e) LIMITATIONS.—(1) The Test and Evaluation Facility shall not be used as a disposal facility unless so authorized by the Commission pursuant to this Act or other applicable law. If such Facility is located at the site of a repository, the Secretary shall obtain the Commission's concurrence on the decontamination and decommissioning of such Facility, *and on the Secretary's conclusion that the activities to be undertaken at such facility will not render the site unsuitable for use as a repository.*

(2) If the site of the Test and Evaluation Facility is not selected for a repository, then the Secretary shall conduct only that part of the in-situ testing program required under

subsection (c) as the Secretary determines to be useful in carrying out the purposes of this Act.

(3) The operation of the Test and Evaluation Facility shall terminate within five years after the date the initial repository begins operation, or sooner if the Secretary determines that the continued operation of the facility is not necessary for research, development, and demonstration purposes.

(4) Notwithstanding any other provision of this subsection, as soon as practicable following any determination by the Secretary, with the concurrence of the Commission, that the site of the Test and Evaluation Facility is not suitable for the development of a repository, the Secretary shall take such actions as are necessary to remove from such site any radioactive material placed on such site as a result of testing and evaluation activities conducted pursuant to this section. This requirement may be waived if the Secretary, with the concurrence of the Commission, shall find that short-term testing and evaluation activities will not endanger the public health and safety.

(f) ENGINEERED BARRIERS.—The system of engineered barriers and selected geology shall have a design life at least as long as that which the Commission requires by regulations issued pursuant to this Act or the Atomic Energy Act of 1954 for repositories.

(g) Nuclear Regulatory Commission Role.—(1) Within one year from the date of the enactment of this Act, the Secretary and the Commission shall reach a written understanding establishing the arrangements for *review,* consultation and coordination in the planning, construction, and operation of the Test and Evaluation Facility in accordance with this Act. The understanding shall stipulate a schedule, consistent with the dates specified in this Act, for the Secretary's submission of, and the Commission's review of and necessary action on—

(A) the Mission Plan prepared pursuant to section 5; and

(B) such reports and other information as the Commission may reasonably require to evaluate any health and safety impacts of the Test and Evaluation Facility.

(2) The understanding shall stipulate the conditions under which the Commission may have access to the Test and Evaluation Facility for the purpose of assessing any public health and safety concerns that it may have. *No shafts may be excavated for the Facility until the Secretary and the Commission have reached the written understanding required under this section.*

(3) The Test and Evaluation Facility and the facilities authorized in ~~section 12~~ *section 12(d)* shall be constructed

and operated as ~~a~~ research, development, and demonstration facilities and shall not be deemed subject to licensing pursuant to section 202 of the Energy Reorganization Act of 1974.

(h) The Secretary shall enter into a written agreement with the Governor of the State in which the Test and Evaluation Facility site is located, or the tribal council of any Indian tribe on whose reservation the Test and Evaluation Facility site is located, establishing the arrangements for a consultative and cooperative role in the construction and operation of the Test and Evaluation Facility. The Secretary shall report to the appropriate committees of Congress on the status of his efforts pursuant to this subsection.

(i) The Secretary shall prepare an environmental assessment prior to excavating major shafts for the Test and Evaluation Facility, and shall prepare an Environmental Impact Statement pursuant to the National Environmental Policy Act of 1969, prior to conducting tests with radioactive materials. Nothing in this subsection shall be construed to limit ~~site characterization~~ *siting research* activities conducted pursuant to section 7. This subsection shall apply only to those activities performed exclusively for the Test and Evaluation Facility.

(j)(1) The Commission shall carry out a continuing analysis of the activities undertaken pursuant to this section

to evaluate the adequacy of attention to public health and safety considerations.

(2) The Commission shall make such reports to the President, the Secretary, and the Congress as it deems appropriate concerning the conduct of activities under this section.

RESEARCH AND DEVELOPMENT ON SPENT FUEL

SEC. 12. (a) The Secretary shall establish a demonstration program, in cooperation with the private sector, for the dry storage of spent fuel at nuclear powerplant sites. Within one year after the date of enactment of this Act, the Secretary shall select at least one, but no more than three candidate sites at nuclear powerplants. In selecting the site or sites, the Secretary shall give preference to utilities which will soon have a shortage of interim storage capacity for spent fuel. Subject to reaching agreement as provided for in subsection (b), the Secretary shall undertake activities to assist the utilities with demonstration projects at such sites, which may use one of the following types of alternate storage technologies: spent fuel storage casks, caissons, or silos. The Secretary shall also undertake a cooperative program with utilities to encourage the development of the technology for spent fuel rod consolidation in existing reactor water storage basins.

(b) To carry out the programs required under subsection (a), the Secretary shall enter into a cooperative agreement with the concerned utilities which specifies, at a minimum, that—

(1) the utility shall select the alternate storage technique, make the land and spent fuel available for the dry storage demonstration, submit and provide site-specific documentation for a license application to the Nuclear Regulatory Commission, construct the facility and obtain a license relating to the facility, operate the facility after licensure, pay the costs required to construct the facility and pay all costs associated with the operation and maintenance of the facility; and

(2) the Secretary shall provide, on a cost-sharing basis, consultative and technical assistance, including the design support and the generic licensing documentation, to help the utility obtain the construction authorization and appropriate license from the Nuclear Regulatory Commission.

(3) the Secretary shall provide generic research and development of alternative spent fuel storage techniques to enhance utility-provided, at-reactor storage capabilities as authorized elsewhere, and further authorized herein.

(c) In carrying out the demonstration program at the site of a nuclear powerplant pursuant to subsection (a), the Secretary may, with the concurrence of the Commission, place spent fuel from such nuclear powerplant in an onsite demonstration facility prior to the owner of such nuclear powerplant obtaining a license from the Commission relative to such facility if the data to be obtained from the onsite demonstration is necessary to obtain such a license from the Commission. The owner of such nuclear powerplant must proceed with all due diligence to obtain such a license from the Commission.

~~(c)~~ *(d)* The consultative and technical assistance referred to in ~~paragraph~~ *subsection* (b)(2) may include, but shall not be limited to, the establishment of a research and development program for the dry storage of not more than three hundred metric tons of spent fuel at existing facilities. The purpose of this research shall be to collect necessary data to assist the utilities in their licensing process.

~~(d)~~ *(e)* The total contribution from the Secretary from funds provided by annual authorizations and appropriations Acts and the use of any Government facilities or services shall not exceed 25 per centum of the total costs of the program authorized under this section as estimated by the Secretary. All remaining costs shall be paid by the specific utilities involved or shall be provided by the Secretary from the fund established under section 15 of this Act.

STATE PAYMENT

SEC. 13. ~~The~~ *(a) Subject to subsection (b) the* Secretary ~~(subject to the next sentence)~~ shall ~~pay~~ *make payments* to each State or Indian tribe which has entered into an agreement pursuant to section ~~9(a)(2)—~~ *9(a)(2) in accordance with the following:*

(1) ~~the sum of $3,000,000 per year~~ *The Secretary shall pay an amount equal to 75 per centum of the expenses incurred by such State or Indian tribe in engaging in any monitoring, testing, evaluation, or other consultation and concurrence activity under section 9(a) with respect to any site. The amount paid by the Secretary under this paragraph shall not exceed $3,000,000 per year* from the date on which the site involved was identified to the date on which a site is selected pursuant to section ~~8: *Provided,* That such~~ *8. Any such* ~~a~~ payment may only be made to a State in which a potential site for a repository has been identified under ~~subsection~~ *section* 6(c), or to an Indian tribe on whose land the potential site has been identified under such ~~section; and~~ *section.*

(2) ~~the sum of~~ *The Secretary shall pay* $10.000,000 per year from the date on which the sit

selection has become effective to the date on which the Secretary declares the repository to be filled to capacity and ready for ~~decommissioning: *Provided*, That such a~~ *decommissioning.* Payment *under this paragraph* may only be made to a State in which a site, selected pursuant to section 8, is located, or to an Indian tribe on whose land the selected site is located.

(b) The Secretary shall make any payment to a State under paragraph (1) or (2) *of subsection (a)* only if the State agrees to provide, to the local governing body or bodies within whose jurisdiction the potential site or effectively selected site is located, at least one-tenth of the payments made by the Secretary to that State under both *such* paragraphs ~~(1) and (2)~~. The State or Indian tribe shall otherwise have discretion to use the payment for whatever purpose it deems necessary including, but not limited to, the State or tribal activities pursuant to agreements entered into in accordance with section 9. Annual payments shall be pro-rated on a three hundred and sixty-five-day basis to the specified dates.

JUDICIAL REVIEW OF AGENCY ACTIONS

SEC. 14. (a) JURISDICTION.—Notwithstanding any other provisions of law, the actions of Government officers or agencies pursuant to this Act shall not be subject to judicial review except as provided in this section. Except for review in the Supreme Court of the United States, the United States

Court of Appeals for the District of Columbia *Circuit* shall have original and exclusive jurisdiction ~~over—~~ *over the following:*

(1) ~~any~~ *Any* civil action for review of any final decision or action of any Government agency or office under this ~~Act: *Provided,* That no action of any Government~~ *Act. For purposes of this paragraph, no action of any Government* agency or office prior to the effective date of the selection of a repository site shall be considered a final decision or action with respect to that ~~site; and~~ *site.*

(2) ~~any~~ *Any* civil action challenging the constitutionality of any decision made, or action taken, under this Act.

(b) Supreme Court Review.— The Supreme Court of the United States shall have exclusive authority to review any interlocutory judgment or order of the Court of Appeals pursuant to this section. The appellant may file a petition for certiorari or a certification as provided in section 1254 of title 28, United States Code, not later than fifteen days after the decision of the Court of Appeals.

(c) Expeditious Review.—The United States Court of Appeals for the District of Columbia and the Supreme Court of the United States shall exercise their powers in such manner as to expedite the determination of cases over which they have jurisdiction under this section. The Court of Appeals shall render its decision on any claim within ninety days from the date the claim is brought unless—

(1) the Court determines that a longer period of time is required to satisfy the requirements of the United States Constitution, or

(2) the Federal agency or officer is not enjoined from complying with the Project Decision Schedule.

(d) Time Limitations.—A civil action for judicial review of any decision or action described in subsection (a) may be brought not later than the thirtieth day after the date of the decision or action, except that if a party shows that such party did not know of the decision or action, and that a reasonable person acting under the circumstances would not have known, such person may bring the civil action no later than thirty days after the date such person acquired actual or constructive knowledge thereof.

PROGRAM FINANCING

Sec. 15. (a) Contracting Authority.—In the performance of his functions under this Act, the Secretary is authorized to enter into contracts with persons licensed under sections 53, 103, and 104 of the Atomic Energy Act of 1954, or other persons possessing waste or spent fuel for the purposes of this ~~Act: *Provided,* That prices~~ *Act. Prices* for disposal services under such contracts shall be established (1) on a nondiscriminatory basis, (2) on such basis as will provide sufficient funds in advance of obligation or expenditure for the functions and activities undertaken to carry out the purposes of this Act, and for the recovery of any funds appropriated to carry out this Act over a reasonable period of time, and (3) on such basis as will assure that no person is required to pay more than his anticipated pro rata share of the estimated costs of carrying out this ~~Act: *And provided further*, That the~~ *Act. The* Secretary shall establish criteria in writing setting forth the terms and conditions under which services under such contracts are to be made available.

(b) LICENSING CONDITIONS.—Notwithstanding any other provision of law, the Commission shall not issue a license (including amendments thereto) to any person to use a utilization or production facility under the authority of section 103 or 104 of the Atomic Energy Act of 1954 unless (1) such person has entered into an agreement with the Secretary under subsection (a), or (2) the Secretary affirms in writing that such person is actively and in good faith negotiating with the Secretary for an agreement under subsection ~~(a): *Provided*, That the~~ *(a). The* Commission, as it deems necessary or appropriate, may require as a precondition to the issuance of a license (including amendments thereto) for any other purpose under section 53, 103, or 104 of the Atomic Energy Act of 1954 that the applicant will have entered into an agreement with the Secretary for the disposal of any waste or spent fuel that may result from the applicant's use of such license.

(c) ESTABLISHMENT OF NUCLEAR WASTE FUND.—There is established in the Treasury of the United States a nuclear waste fund (hereinafter in this section referred to as the "fund"). The fund shall consist of (1) all receipts, proceeds, and recoveries realized by the Secretary pursuant to subsections (a) and (e), which shall be deposited in the fund immediately upon their realization; (2) the unexpended balances of any moneys available on the effective date of this Act for functions or activities necessary or incident to the disposal of waste or spent fuel, which shall be automatically transferred to the fund on that date; and (3) any appropriations made by Congress to the fund.

(d) USE OF FUND.—~~To such extent or in such amounts as are provided in appropriation Acts, the Secretary may make expenditures from the fund, without further appropriation and without fiscal year limitation but within such specific directives or limitations as may be included in authorization Acts, for any purpose necessary or appropriate to the~~ *The Secretary may make expenditures from the fund, subject to authorization and appropriation thereof, for any purpose necessary or appropriate to the* conduct of the Secretary's functions and activities or the provision or anticipated provision of services pursuant to this Act, including but not limited to (1) the disposal of waste and spent fuel, (2) the conduct of research, development, and demonstration activities related to the disposal of waste and spent fuel, (3) the acquisition, design, construction, modification, replacement, and operation of facilities necessary or incident thereto, and (4) the making of payments pursuant to section ~~14.~~ *13.*

(e) INVESTMENT.—If the Secretary determines that the moneys in the fund at any time are in excess of current needs, he may request the Secretary of the Treasury to invest such excess or so much thereof as he deems advisable in obligations of the United States having maturities suitable for the needs of the fund and bearing interest at rates determined by the Secretary of the Treasury taking into consideration the current average market yield on outstanding marketable obligations of the United States with remaining periods to maturity comparable to the maturities of such ~~investments:~~ ~~*Provided, That*~~ *investments, except that* the interest rate on such investments shall not exceed the average interest rate applicable to existing borrowing.

(f) APPORTIONMENT EXEMPTION.—Receipts, proceeds, and recoveries realized by the Secretary pursuant to this section, and expenditures from the fund, shall be exempt from annual apportionment under the provisions of section 3679 of the Revised Statutes (31 U.S.C. 665).

H.R. 5016—NUCLEAR WASTE MANAGEMENT COMPREHENSIVE LEGISLATION—BOUQUARD/LUJAN PROPOSAL

WEDNESDAY, OCTOBER 7, 1981

House of Representatives,
Committee on Science and Technology,
Subcommittee on Energy Research and Production,
Washington, D.C.

The subcommittee met at 1:30 p.m., in room 2318, Rayburn House Office Building, Hon. Marilyn L. Bouquard (chairman of the subcommittee) presiding.

Present: Representatives Bouquard, Lundine, and Lujan.

Staff present: Dr. John V. Dugan, Jr., staff director, Louis Ventre, Jr., counsel, and Joyce Gross Freiwald, minority science consultant.

Mrs. **Bouquard**. The subcommittee will come to order.

Good afternoon, ladies and gentlemen. Since the House will adjourn at 3 o'clock today, we are going to dispense with the opening remarks and leave the record open for insertion. We will also closely observe the 5-minute rule for the questioning of the witnesses.

Our first witness today will be Mr. Holmes Brown, the associate director of the National Governors' Association here in Washington, D.C. Mr. Brown has been before this subcommittee a number of times in the past, and we certainly want to welcome him here today. Mr. Brown.

We have copies of your testimony and you may summarize or proceed as you wish. The entire written testimony will be included in the record. Please proceed.

TESTIMONY OF HOLMES BROWN, ASSOCIATE DIRECTOR, NATIONAL GOVERNORS' ASSOCIATION, ON BEHALF OF GOV. JOHN V. EVANS, CHAIRMAN, SUBCOMMITTEE ON NUCLEAR POWER

Mr. **Brown**. Thank you, Madam Chairman.

I will be presenting a statement today on behalf of Gov. John Evans, Governor of Idaho, as chairman of the nuclear power subcommittee of the National Governors' Association.

The statement itself is fairly lengthy and attempts to respond to a number of the issues raised in the draft bill and also H.R. 1993 that is under consideration.

What I would like to do is submit the entire statement for the record and briefly go through some of the new points that we would like to respond to in the recent legislation.

The first issue I would like to address is that of State participation. The Governors' Association has long maintained that the States must play a primary role in decisions affecting nuclear waste facilities. We have used the terms "consultation and concurrence" and "cooperative federalism" to describe how this should happen.

The positions and formula contained in the September 29 discussion draft approximates the policy recommended by the National Governors' Association. However, there are several points of disagreement.

First, the Governors and the State planning council have recommended a procedure where both Houses of Congress are required to support the Department of Energy's plan rather than one House voting with the State, as the discussion draft provides.

The States feel that the burden of securing support in Congress should be on the Department of Energy rather than on the State and that if the Department has designed and implemented its program correctly, congressional assent in both Houses is not an unreasonable requirement.

The second comment on the participation provisions provided in the discussion draft involves the time provided for States to submit their objections to the repository development report. Should the President rapidly convey his approval to Congress, a State might have closer to a month to formulate its response to this report rather than the maximum of 90 days that would be permissible if the entire time frame were utilized by the Congress and President.

The Senate bill that was recently submitted also allows for a full 90-day period in which States could formulate their response to the DOE plan.

We would recommend that that full time be allotted to the States.

Third, a technical point on legislative procedure. Last year the bills that passed the House and Senate provided that when a resolution was referred to the committees of jurisdiction that if the committees did not report within a set period of time the resolution would automatically be sent to the floor of the House or the Senate rather than having it be voted out of committee.

We feel that there is an unnecessary step provided in this bill and would recommend that a specific period be allotted to the committees and if they did not act during that time, the resolution be reported directly to the floor and be available for debate.

A new element in the draft has to do with the State payment. The National Governors' Association appreciates the inclusion of section 13 which recognizes the Federal responsibility to assist States throughout the development of a repository. Section 13 authorizes funds for States to carry out, among other things, responsibilities incurred as a result of agreements negotiated under section 8. Consultation and concurrence provisions such as independent monitoring, public education, and investigations could also be covered.

In defining Federal assistance, the Governors' Association also refers to the need for impact assistance to offset or ameliorate potential social, economic, and political impact. Presumably, section 13 is intended for that purpose as well. Discussion among State officials on the extent of compensation for hosting a waste facility have focused on several key points.

First, a distinction must be made between compensation and incentive payments, which might induce a community to accept a facility.

Second, compensation payments should be computed with some specificity, as is suggested in section 108 of H.R. 1993, and these payments should be directed to the community and State in amounts proportional to the impacts which those entities incur.

Third, if the preponderance of funds allocated to a State or community is incentives rather than compensation, some parties will consider the payments a bribe and questions on the legitimacy of health and safety procedures may arise. In making these observations, the States don't wish to appear ungrateful. It is a rare occurrence these days when States are offered Federal money. However, in the interest of devising the most acceptable waste management bill, States feel that section 13 deserves further study.

In the matter of defense waste, Governors are aware that application of State participation provisions to defense waste was the major factor in stymieing last year's nuclear waste bill.

I do not raise the issue in this forum to complicate an already complex issue, but to remind Congress that for States defense wastes pose not just jurisdictional problems but the same health and safety, environmental, and political issues as civilian waste. The States, based on past experience with defense bases and weapons facilities, are keenly aware of the unique issues surrounding State/military relations. Yet waste is discarded material with no further use to the Government. It appears to occupy a different category than active defense facilities.

The National Governors' Association urges, at the least, that the issue of defense waste not be ignored but that the congressional committees of jurisdiction explore this session ways of resolving the national security and procedural questions that prevent a greater State role in the disposal of military waste.

Another point of interest to the Governors is that of the State planning council. The National Governors' Association has recommended the legislative authorization of a State planning council for nearly 5 years. The nuclear waste bill which passed the Senate last year contained such a provision, and H.R. 1993 creates a State planning council in section 112.

Throughout its 18-month life the Governors established a close and profitable relationship with the State planning council created by Executive order in February 1980.

We recommend the authorization by Congress of another such council with two changes from H.R. 1993:

First, Federal members should not be accorded voting rights, and second, that the council should be able to hire its own staff.

On the issue of expedited licensing and judicial review procedures which are included in the discussion draft, while anxious to expedite the construction of a high-level waste repository, the Governors would like to comment at a later date on the licensing procedures and judicial review outlined in section 7 (d) (1)-(11) and section 14.

I have asked the National Association of Attorneys General to review these sections. In addition, the nuclear power subcommittee of the National Governors' Association will be meeting next week to review pending legislation. I request the opportunity to submit comments on these sections when opinions from these two groups are available.

The Governors participated in discussions earlier this year on licensing revisions involving nuclear powerplant operation. Those changes in procedure were designed to correct problems caused by a temporary shortage of staff in the Nuclear Regulatory Commission.

The rules established in section 7 will govern licensing of all future high-level waste facilities. For this reason we wish to carefully examine the implications of that section.

In conclusion, the National Governors' Association welcomes this opportunity to comment on proposed high-level waste legislation. The States worked diligently last session to secure passage of such a bill and are confident that this 97th Congress will enact a comprehensive waste management plan. The NGA has adopted extensive policy recommendations on waste legislation over the years. We have endorsed a decisive state role.

Last December Congress adopted the Low-Level Radioactive Waste Policy Act which reflected many of the recommendations of the States as represented by the NGA, the State Planning Council and the National Conference of State Legislatures. I am happy to report that all regions of the country are actively engaged in carrying out the mandate of the low-level waste legislation.

This year's high-level waste bill contains many of the provisions long advocated by the Governors. We are gratified by the access to and cooperation with Congress which we have experienced thus far. The Governors are convinced that by working together with the legislative and executive branches we can devise a waste management program which satisfactorily balances the interests of all parties and protects the public health and safety which is our paramount goal.

Thank you.

[The prepared statement of Mr. Brown follows:]

Testimony of

Holmes Brown
National Governors' Association

on behalf of

Governor John V. Evans
Chairman, Subcommittee on Nuclear Power

Madam Chairman, Members of the Committee:

As Governor of Idaho and as Chairman of the Subcommittee on Nuclear Power of the National Governors' Association, I very much appreciate the opportunity to submit a statement to the Subcommittee on Energy Research and Production of the Committee on Science and Technology. The issue of nuclear waste is of critical importance to me, the residents of my state and my fellow governors. It is a problem that has grown in scope and magnitude since America and the world entered the nuclear era 35 years ago. As we increase our reliance on nuclear power, we are increasingly faced with a public mandate to resolve the waste issue. We have unfortunately reaped the benefits of the atom without a public policy for resolving the dilemma of its wastes.

The extent of those wastes is now of extreme concern. Seventy-five million gallons of highly radioactive material are stored in temporary tanks at federal facilities. The over-70 licensed, commercial reactors in the country have produced another 600,000 gallons of highly radioactive wastes and over 8,000 metric tons of spentreactor fuel. That spent fuel is now distributed around the nation in water-filled holding tanks. As we are all aware, the public is becoming more and more apprehensive about the effects and disposition of those wastes. That public apprehension and the lack of a clear policy in the area will continue to cloud the discussion of the future of nuclear power until we have Congressional action on the issue.

The governors, through the National Governors' Association, have long supported a comprehensive national waste management policy and program. The Subcommittee which I chair has devoted considerable time and effort to formulating and promoting the passage of nuclear waste management legislation. The adoption last session of the National Low-Level Radioactive Waste Policy Act, which incorporates many of the recommendations of NGA's Low-Level Waste Task Force, was gratifying. States have subsequently taken an active role in implementing the provisions of the Act. Recent initiatives regarding both high-and low-level radioactive waste demonstrate the commitment and capability of the Governors to continue to assist in the resolution of these issues. While we have been concerned about many diverse aspects of the waste problem, our primary focus has been to ensure that the states and the public play a key role in the decision-making process to guarantee the protection of health and safety and the environment. For governors, the most critical aspect of the legislation is the form and extent of the state's participation.

Let me assure you that the states' insistence on a substantial role in the siting and development of a repository is in no way intended to slow or jeopardize the disposal of high-level radioactive waste. The Governors' Association worked diligently last year for the passage of a nuclear waste bill. We remain committed to that end and are encouraged by the cooperation which has marked this year's Congressional deliberations. Both thoses states which are potential hosts and those which generate high-level waste support the expeditious adoption of a comprehensive waste management program. Failure to do so only increases public doubts and may later lead to the hurried passage of inadequate legislation with a strong federal orientation. Experience demonstrates that state/federal cooperation yields the best political and technical solutions. We intend to continue to foster that cooperation in nuclear waste management. I would now like to turn to specific elements of the legislation under consideration.

State Participation

The National Governors' Association has long maintained that the states must play a primary role in decisions affecting nuclear waste facilities. We have used the terms "consultation and concurrence" and "cooperative federalism" to describe how that should happen. Our position is based on the principle that while no state may reasonably impede the national interest, federalism makes the states equal partners in pursuing that interest.

The NGA's original policy statement on waste management, adopted in 1977, insisted that states be given the absolute power to veto a project. Subsequently, the states have dropped that provision and in its place endorsed a process of extensive participation in siting and construction and a Congressional review if a state objects to DOE plans. The formula contained in the September 29 Discussion Draft approximates the policy recommended by the National Governors' Association. There are, however, several points of disagreement.

o First, the governors and the State Planning Council have recommended a procedure where both houses of Congress are required to support the Department of Energy's plan rather than one house voting with the state, as the Discussion Draft provides. The states feel that the burden of securing support in Congress should be on DOE rather than on the state and that if the Department has designed and implemented its program correctly, Congressional assent in both houses is not an unreasonable requirement.

o Second, the time provided for states to submit their objections to the Repository Development Report may not be adequate. Should the President rapidly convey his approval to Congress, a state might have closer to a month to formulate its response rather than the maximum 90 days possible under this bill or the 90 days allowed in the Senate bill, S. 1662. We recommend permitting states up to 90 days to respond.

o Thirdly, the legislative procedure established in Sec. 8 (d) seem unncessarily cumbersome. Requiring a vote to discharge the resolution from committee introduces an additional opportunity for delay. We would recommend a procedure whereby the resolution would be automatically discharged from the Committee if it has not acted within a specified number of days after referral.

We are convinced that early and substantial involvement of state and local officials and the public contained in the bill will strengthen and accelerate the waste management program by building public confidence and diminishing opportunities for obstructionism and litigation. The provision permitting state/ DOE agreements is constructive and supportive of this goal. The states wish to commend the authors of the bill and committee staff for considering state interests. The provisions contained in the present version are a vast improvement over the previous bill, and we trust the suggestions we have offered will be accepted as worthwhile improvements.

Chronology

NGA policy states that the ultimate disposal of high-level waste must have the highest priority and that the solution must not be delayed, but accomplished through utilizing available and workable technologies. Thus, the National Governors' Association strongly supports the adoption of a timetable leading to the operation of a permanent repository. Let the governors add, however, a word of caution. We know from experience that any decisions involving radioactivity arouse intense interest, if not controversy. While a rigorous chronology is advisable, the governors insist that a technically conservative program is essential for ultimate success. Thorough investigations of each candidate site should be carried out, since failures at other nuclear waste facilities both high-and low-level have created an unfortunate legacy of public mistrust. Another failure can only complicate the task which a high-level waste bill seeks to remedy.

An accelerated time frame may compel the Department to select only those states which have received extensive study, even if they are not the most promising sites on a national scale. States have accumulated years of experience with the Department of Energy's site investigations. The views of state personnel on DOE operations up to this point and the views of state geologists would prove useful in devising an accelerated, but realistic, timetable. The National Governors' Association would be glad to assist in securing such information from state officials.

State Payment

NGA appreciates the inclusion of Section 13 which recognizes the federal responsibility to assist states throughout the development of a repository. Section 13 authorizes funds for states to carry out, among other things, responsibilities incurred as a result of agreements negotiated under Section 8. Consultation and concurrence provisions such as independent monitoring, public education and investigations could be covered. In defining federal assistance, the Governors' Association also refers to the need for impact assistance to offset or ameliorate potential social, economic and policial impacts. Presumably, Section 13 is intended for that purpose as well. Discussion among state officials on the extent of compensation for hosting a waste facility have focussed on several key points.

- First, a distinction must be made between compensation for quantifiable impacts and incentive payments to induce a community to accept a facility.
- Second, compensation payments should be computed with some specificty as suggested in Section 108 of HR 1993 and directed to the community and state in amounts proportional to the impacts they incur.

o Third, if the preponderance of funds allocated to a state or community is incentives rather than compensation, some parties will consider the payments a bribe and questions about the legitimacy of health and safety procedures may arise. In making these observations, the states don't wish to appear ungrateful. It is a rare occurence these days when states are offered federal money. However, in the interest of devising the most acceptable waste mangement bill, states feel Section 13 deserves futher study.

Defense Waste

Governors are aware that application of state participation provisions to defense waste was a major factor in stymieing last year's nuclear waste bill. I do not raise the issue in this forum to complicate an already complex issue, but to remind Congress that for states defense wastes pose not just jurisdictional problems but the same health and safety, environmental and political issues as civilian waste. The states, based on past experience with defense bases and weapons facilities, are keeuly aware of the unique issues surrounding state/military relations. Yet waste is discarded material of no further use to the government. It appears to occupy a different category than active defense facilities. The National Governors' Association urges, at the least, that the issue of defense waste not be ignored but that the Congressional committees of jurisdiction explore this session ways of resolving the national security and procedural questions that prevent a greater state role in the disposal of military waste.

State Planning Council

The National Governors' Association has recommended the legislative authorization of a State Planning Council for nearly five years. The Nuclear Waste Bill which passed the Senate last year contained such a provision, and HR 1993 creates a State Planning Council in Section 112. Throughout its 18-month life, the governors established a close and profitable relationship with the State Planning Council, created by Executive Order in February, 1980. We recommend authorization by Congress of another such council with two changes from HR 1993:

- Federal members should not be accorded voting rights
- The council should be able to hire its own staff.

Expedited Licensing and Judicial Review

While anxious to expedite the construction of a high-level waste repository, the governors would like to comment at a later date on the licensing procedures and judicial review outlined in Section 7 (d)(1)-(11) and Section 14. I have asked the National Association of Attorneys General to review these sections. In addition, the Nuclear Power Subcommittee of the National Governors' Association will be meeting next week to review pending legislation. I request the opportunity to submit comments on these sections when opinions from these two groups are available.

The governors participated in discussions earlier this year on licensing revisions involving nuclear power plant operation. Those changes in procedure were designed to correct problems caused by a temporary shortage of staff in the Nuclear Regulatory Commission. The rules established in Section 7 will govern licensing of all future high-level waste facilities. For this reason, we wish to carefully examine the implications of that Section.

Conclusion

The National Governors' Association welcomes this opportunity to comment on proposed high-level waste legislation. The states worked diligently last session to secure passage of such a bill and are confident that this 97th Congress will enact a comprehensive waste management plan. The NGA has adopted extensive policy recommendations on waste legislation over the years. We have endorsed a decisive state role.

Last December, Congress adopted the Low-Level Radioactive Waste Policy Act which reflected many of the recommendations of the states as represented by the NGA, the State Planning Council and the National Conference of State Legislatures. I am happy to report that all regions of the country are actively engaged in carrying out the mandate of the low-level waste legislation.

This year's high-level waste bill contains many of the provisions long-advocated by the governors. We are gratified by the access to and cooperation with Congress we have experienced thus far. The governors are convinced that by working together with the legislative and executive branches, we can devise a waste management program which satisfactorily balances the interests of all parties and protects the public health and safety which is our paramount goal.

Mrs. **BOUQUARD**. Thank you very much, Mr. Brown.

You touched on the issue of defense waste. Do you believe that a significant argument in excluding defense waste is that the commercial sector is going to be paying the entire cost of this program and that they shouldn't be responsible for paying for the disposal of defense waste?

Mr. **BROWN**. That is a legitimate argument in terms of funding the specific facilities that are intended in this legislation. Our point is that Congress should address this issue in some form. Perhaps this bill should deal exclusively with civilian waste, but at some point the committees of jurisdiction should address the issue of State participation in the siting and construction of defense facilities.

As I mentioned, many States have the same political and health problems with defense wastes as they do with commercial. Admittedly, in this bill, if it is directed exclusively toward the construction of civilian facilities, you shouldn't mix the two together.

We are not suggesting that defense waste and commercial should be in the same facility. If they were, it would involve some redesigning.

Mrs. **BOUQUARD**. What you are asking for is additional legislation which also addresses the problem of military waste.

Mr. **BROWN**. That is correct.

Mrs. **BOUQUARD**. Do you believe the expanded State role that is provided for in the Bouquard/Lujan bill is an improvement over past legislation? Do you endorse this?

Mr. **BROWN**. Yes, that is correct.

Mrs. **BOUQUARD**. Very good.

In the Bouquard/Lujan proposal, the review of the repository site selection by the Congress is completed before a license application is submitted to the NRC rather than congressional review after a licensing process. Do you endorse this approach?

Mr. **BROWN**. Yes. That is a matter that has been discussed at length by the Governors' Association and by the State Planning Council. Our feeling is that where States may raise both socioeconomic, procedural, and technical questions Congress is going to be most inclined to review the procedural and socioeconomic issues and defer on highly technical issues to the Nuclear Regulatory Commission. For that reason we feel that the State appeal should go to Congress before the NRC review. In the case where Congress feels incapable of dealing with the technical issues, they can address the others and then refer the plan to the Nuclear Regulatory Commission.

Mrs. **BOUQUARD**. Do you believe that the hybridized system for intergovernment licensing of repositories is appropriate considering the fact that DOE/NRC are both separately responsible for protecting the public health and safety, and also considering the fact that DOE, being a Government agency, is not profit oriented and can therefore be trusted to design and construct and operate this repository in the best interests of the country?

Mr. **BROWN**. I'm sorry. The term is "hybridized"?

Mrs. **BOUQUARD**. Hybridized system, yes. Streamlining the licensing system as proposed in the bill. Do you think this is appropriate, our streamlining provision, not having overlap jurisdiction by DOE and NRC?

Mr. BROWN. As I mentioned in my testimony, the Governors' Association would prefer to obtain the reaction of the attorneys general and our own subcommittee before we comment in detail on that.

Mrs. BOUQUARD. Thank you very much.

Mr. Lundine.

Mr. LUNDINE. Thank you, Madam Chairman.

I apologize for being a little late. So if what I ask is redundant, I apologize in advance.

I take it that you do favor the reauthorization of the State Planning Council. What functions do you see it performing that might not get done or might not take the interests of the States into close enough account if it is abolished?

Mr. BROWN. As I mentioned in my testimony, the National Governors' Association has endorsed the creation of the State Planning Council for the past 5 years or so. We were gratified by the creation through Executive order of the council in February of 1980.

First of all, the council provided an opportunity for representatives not only of the States but of the State legislatures, of localities, of American Indian tribes, and other elected officials to meet as a group to debate the policy issues involved in siting and construction of a high-level waste repository.

There is no analogous group in existence at this point. And that was one of the major virtues of the council, bringing together all interested parties.

Second, the council as envisioned by the National Governors' Association would act in an advisory capacity to the President and to the Department of Energy. It would provide a forum for sounding out State concerns and bringing them to the attention of these departments. That is not the case at this point. There is no body in the Federal Government with that type of access, with that type of mandate.

Mr. LUNDINE. In the determination of siting, do you regard the differences that could occur as strictly political, strictly technical, or a combination of technical and political issues that could arise with respect to a siting question?

Mr. BROWN. Disagreements between the Federal Government and the State? I think the past record is one of both. Many States have highly qualified technical personnel—geologists and engineers. On occasion they have taken exception to some of the activities that the Federal Government has carried out. Additionally, there are instances where impact assistance concerns on the part of the State and also political sensitivities have not been attended to.

Our guess is that pattern would continue. Anticipating what types of objections a State might raise to the DOE plan in Congress, I think we would expect both political problems as well as technical ones.

Mr. LUNDINE. I realize that you have testified in favor of a two-House veto. Would you consider or can you comment at all on my proposal that we have some system of arbitration?

Mr. **Brown**. The National Governors' Association and the State Planning Council have debated at length over the last 2 years various mechanisms which would allow States to appeal Federal decisions. Initially, in 1977 the National Governors' Association adopted the position that States should be given an absolute veto over the siting of a facility. Subsequent to that the Governors substituted for that the consultation and concurrence provision and adopted a procedure whereby the DOE decision would be appealed to Congress. That is the official policy of the Governors and the State Planning Council.

The rationale for that congressional review plan is an attempt to find some neutral body, that is, neutral beyond the Department of Energy and presumably the executive branch, which could review State objections.

Philosophically, I don't believe the Governors would have any objection to an arbitration panel. Practically, I think the Governors have felt that Congress is familiar with these issues and it is an extant body, thus that is the option that they have chosen.

Mr. **Lundine**. Finally, on page 5 of your testimony you make a distinction between compensation for quantifiable impacts and incentive payments to induce a community to accept a facility. While I appreciate your complimentary remarks concerning my bill, I cannot understand the distinction. Can you explain that?

Mr. **Brown**. Surely. This distinction is an outgrowth more of discussions involving low-level waste facilities than high-level waste facilities since those are more imminent than the high-level waste facility.

The distinction here is between the quantifiable impact on a community and a lump sum payment. Things that can be measured, such as additional transportation problems, policing, possibly expanded schools and hospitals. Property values that may be affected are examples of impacts. In other words, assistance would simply compensate a community for a measurable impact of the facility. Above and beyond that might be payments that would simply go into the State or local treasury for whatever use the community wishes. For instance, in Barnwell, S.C., with the low-level waste facility, the operators of the facility do make an annual payment that is not reimbursement for any direct impact but is simply payment to the community. That would be an example of incentive payments.

So above and beyond measurable impact there could be an incentive payment. If you accept the facility you will get this much money. Which is not tied directly to any measurable cost.

An incentive scheme has been put forth by one Governor in regard to low-level waste. He said we should establish a large national fund, say of $50 million, and the first community that volunteers for a site will get, say, $25 million; the next will get $10 million; the next will get $5 million, and so on. But there wouldn't be any attempt to tie these payments into measurable impact.

In any case, that would be the distinction.

The philosophical question that has arisen is whether a large payment like this could be interpreted as an attempt to bribe a community in order for them to overlook the health and safety factors that might be involved in constructing a facility.

Mr. **Lundine**. Thank you.

Thank you, Madam Chairman.

Mrs. **Bouquard**. Thank you, Mr. Lundine.

Mr. Lujan.

Mr. **Lujan**. Thank you very much, Madam Chairman.

Let me pursue this business of approval and veto. I am not quite sure what it is you are saying, whether you think that in order to be able to put it within a State you need both houses acting positively. Is that what you are saying?

Mr. **Brown**. That is correct. The NGA policy states that when the Department of Energy plan is submitted to Congress that it would require a resolution of approval on the part of both houses of Congress in order for the plan to proceed.

Mr. **Lujan**. So that is really the strongest measure, the strongest support.

Mr. **Brown**. That is correct. Surprisingly enough, yes.

Mr. **Lujan**. I can understand that from the State's point of view.

The other thing that we have in the bill is that while we are in the test and evaluation portion we want a substantial State input into it but really in a sense feel that we are doing research and that the State gets its big opportunity, and so does everybody else, at the time when it is decided that it is going to be a permanent repository, but in the meantime go ahead and do some research and discuss it with the States, but not make a real big deal about it. What is the Governors' Association's feeling on that? Do they insist on veto provisions during the research period?

Mr. **Brown**. We discussed this some at the last hearing. The Governors would certainly prefer a substantial State involvement during the test and evaluation facility, and that is an obvious improvement in this bill. There are considerable consultation provisions allowed. The objections which the Governors raised last time had to do with what the intent of the test and evaluation facility might be, and this probably had more to do with the timing of the test and evaluation facility, how that fits into the overall repository development.

Mr. **Lujan**. Well, how it fits in is that we characterize, the site, at the same time doing some research with waste, it's all retrievable, all helpful in deciding on the best site for a repository and if it is not, the waste will be taken out and sent to the one that is the best site.

Mr. **Brown**. Our view is that the provisions in this bill are a vast improvement.

Mr. **Lujan**. Do you feel they are good enough? Does the Governors' Association feel they are good enough?

Mr. **Brown**. I will have to talk next week to the States who are the most likely candidates for a test and evaluation facility.

Mr. **Lujan**. I would encourage you that you talk to them along those lines. What we are saying is that we go test the places out, do some research, and move along with that without making a big deal out of it. Certainly we should involve the State in talking it over with DOE about any objections that they may have in an effort to try to work them all out. They have done that with Wipp, and very successfully came to an agreement. And I raise that point simply because it seems to me that it wouldn't be a betrayal of the

Governor's role to say, hey, let's move along with the research and characterization, and then if it is going to be a permanent repository, then we'll take out our big guns.

Thank you, Madam Chairman.

Mrs. BOUQUARD. Thank you very much, Mr. Lujan.

I would like to thank you for your very constructive testimony today, Mr. Brown. We may have additional written questions for you. Would you be willing to respond to them for the record?

Mr. BROWN. Certainly.

Mrs. BOUQUARD. Thank you very much for being with us today.

Our next witness is Mr. Brooks Yeager who is the Washington representative of the Sierra Club. We are very happy to have Mr. Yeager with us today to present his testimony.

We do have your statement, your written remarks. You may summarize or proceed as you wish, and your entire written testimony will be made a part of the record.

TESTIMONY OF BROOKS YEAGER, WASHINGTON REPRESENTATIVE, SIERRA CLUB

Mr. YEAGER. Thank you very much, Madam Chairman, Mr. Lujan and Mr. Lundine.

I will attempt to summarize my statement. It grew a little bit in the writing, I am afraid.

I am grateful for the opportunity to present the views of the Sierra Club on the general issue of nuclear waste disposal, and in particular our comments on H.R. 1993, the bill introduced by Mr. Lundine, and the unnumbered draft legislation developed by the staff of the subcommittee on behalf of the chairman and Mr. Lujan.

The Sierra Club is an organization of more than 235,000 members dedicated to the protection and enhancement of the environment.

My name is Brooks Yeager, and I am the club's Washington representative for energy policy.

The Sierra Club has consistently supported the development of comprehensive legislation to provide a statutory basis for the Federal Government's waste management program. As you know, during the last Congress we worked to forge compromises necessary for the enactment of H.R. 8378, which was the legislation reported by the formerly Interstate and Foreign Commerce Committee and the Interior Committee which passed the House last December 3. Although that bill was never enacted, we also have testified before the Interior Committee on the reintroduction of what is essentially identical language in the form of H.R. 3809 this year, and our testimony was generally in support of that legislation at the time.

We have been very encouraged by the willingness of all three major committees in the House to attempt to negotiate some of the discrepancies which slowed down the progress of nuclear waste legislation last year.

In particular, we are encouraged by the willingness of the chairman of the subcommittee and the other members to take a comprehensive approach to the waste problem, and we note with pleasure the willingness of the subcommittee to consider a meaningful State role in repository siting, the formulation of a fee-based waste management system, and an overall commitment to final geologic disposal in a licensed geologic repository. These are all concepts which the Sierra Club has worked for over the years and which we continue to support.

The question which the unsolved problem of nuclear waste poses to our society comes in two parts, in our view. One is the technical part; the other is the political and institutional part.

It is our belief that the mere existence of various techniques for disposing of or storing nuclear waste constitutes at best only half the solution to the problem.

Although I am not a scientist, it is my estimation in looking at the evidence that even within the scientific community it is generally accepted that the most promising method of finally disposing of nuclear waste is through geologic interment. However, even within people who regard that as a fact, I believe it is clearly perceived that remaining questions which must be answered prior to the development of a repository include some still important problems, such as the completion of a systematic geological examination and characterization of media other than salt, and the effective characterization of ground water flow paths around the potential repositories, and also the further study of the thermal and mechanical behavior of proposed host rocks.

We believe that these and other important questions can be resolved, given the resources to do so and the program timeline for the establishment of a waste repository which is structured so as to allow adequate time for the necessary research to be accomplished.

We have somewhat less confidence, I would have to say, in the resolution of many of the outstanding institutional issues which affect the waste management program. Some of this hesitancy on our part comes from the history of the waste management effort of the Federal Government which is a long and, I would say, tortured history.

To be specific, one of the prime ways in which the question of public confidence in the Federal effort to dispose of nuclear waste has been posed is in the waste confidence proceeding which is currently being undertaken by the Nuclear Regulatory Commission. That proceeding, which is rulemaking arising out of a court decision in 1979, has been basically about one key question, and that question is whether there is reasonable assurance that the program established by the U.S. Government will in fact be able to site and license and dispose of nuclear waste in a licensed repository within a reasonable amount of time.

A great deal of this question with regard to confidence comes from the politics of siting a waste repository. This is something I know that Representative Lujan is very aware of. We have talked about it before. Many people who are willing to accept the Government's assurances that the technical questions regarding geologic disposal can be resolved are not correspondingly convinced that the Government will be able to make the long-term effort necessary to find and license an acceptable site for a repository.

The history of Project Salt Vault, which Dr. William Hambleton, the director of the Kansas Geological Society, touched on in his testimony earlier this year before this subcommittee, is, I think, a key case in point, and perhaps one of the reasons for that problem in the public mind. We are very sensitive to the possibility that any premature decision with regard to siting could result in another problem for the program of the size and magnitude of the political repercussions of Project Salt Vault.

The history of that was that after the Federal effort there was pulled out, the political repercussions of having the public knowledge that an inadequate site had in fact been chosen and advocated led to a 3-year or 5-year hiatus in the efforts of the agencies at that time toward geological repositories and instead diverted attention toward monitored, or at that time, retrievable surface storage facilities. It is not something that we would like to see happen again.

We don't believe that the public can be expected to accept the inevitable uncertainties that are present in any solution to the waste problem unless it is clear that the institutional process in the Federal program will provide an accurate and straightforward test of the safety and validity of the program. To the extent that proposed legislation attempts to short circuit the tests that are embodied in Federal licensing and NEPA practices, we think that that tends to in some extent invalidate or erode the public confidence, and also the integrity of the program itself. At the same time, we don't think that public confidence will be improved unless it is clear that the actual research problems which remain are being attacked vigorously, and to that extent, proposals for research facilities which do not clearly attack what are the remaining research problems present extreme difficulties in terms of public acceptance of the program.

I would like to touch on the research aspects of this first, because this committee has such an important, prominent role with regard to research activities.

Our view of the subcommittee's and the committee's role in that regard would be that it would be extremely useful to craft statutory guidelines for the research necessary to site and license a safe geological repository. We believe that both H.R. 1993 and the subcommittee discussion draft address this issue at some length but that neither bill is completely successful in its approach to the problem.

Section 101 of H.R. 1993 requires as part of the preparation of the so-called mission plan a coordinated assessment of the research needs that are necessary to arrive at a geological repository. We believe that such an assessment would be welcome and that it could be accomplished as part of the long-awaited revision of the Department of Energy's earth science technical plan. But even without a coordinated assessment of that type we think that the remaining research questions are clear and that they are basically within the area of site-specific and earth sciences research.

What disturbs the Sierra Club and disturbs me about the legislation that is proposed today is that both H.R. 1993 and the subcommittee draft seem to direct the research program of the Department toward a facility, specifically the T. & E. facility, which does not clearly address the research that experts in many forums have testified needs to be accomplished.

The subcommittee's T. & E. facility seems to be a hybrid facility somewhere between a demonstration of existing technology for the emplacement of radioactive waste and an advanced form of site characterization. Specifically I draw that conclusion because of the tests that are prescribed in the subcommittee draft to be accomplished in the T. & E. facility.

The interesting thing is that the administration's description in public forums of the T. & E. facility doesn't match the T. & E. facility that is in this bill. The administration's description is of a T. & E. facility which is designed for the resolution of generic issues with regard to waste emplacement, issues that presumably would bear on the engineering and design factors involved in the construction of a final repository.

I am not a civil engineer and I can't judge personally whether that research that the administration has declared necesesary is, in fact, necessary, but I believe that if it is necessary, there is very little advantage to be gained from performing that research at a potential repository site, and I would like to explain why.

If you accept the words of Kenneth Davis, the Deputy Secretary of Energy, that—

> The purpose of the test and evaluation facility * * * is not for extended site characterization at a favored site; this will continue at all three sites in parallel, in any event. The test and evaluation facility will develop waste emplacement technology; this technology will be used in the licensing process whether or not the first waste repository is located at the site of the test and evaluation facility.

It is clear that the site of the T. & E. facility is irrelevant to its research purpose.

On the other hand, if one looks at the list of tests that are required in the subcommittee's draft, it is apparent that those are site-specific tests which under Mr. Davis' view would come under an advanced form of site characterization.

I believe that there are disadvantages in performing those tests at a potential respository site. Those disadvantages include a potential for physical damage to the repository site itself, especially that posed by the failure mode tests required in the subcommittee draft; the potential for prejudicing the licensing of the actual repository if it is established at the same site because of the enormous momentum that will be developed to, in fact, license a site at which you have already spent $200 or $300 million; and the potential damage to the public trust and confidence posed by the establishment of a facility which is indistinguishable from a repository in the public eye but which is not subject to NRC licensing, NEPA, or State role requirements.

The Sierra Club would recommend that if the subcommittee believes after an assessment of the research needs that are proposed by the Department that the T. & E. facility is a good idea, it should attempt to locate that facility at an existing test site which is already dirty. For instance, the Climax facility at the Nevada Test Site could be used. There is already a shaft there; there are already mine drifts off the shaft; there is already spent fuel in place in the Climax facility for testing purposes.

I think there would be little opposition, at least from our point of view, for a careful logistics test to be emplaced at a facility like that. Our opposition comes primarily from the confusion between this testing purpose and the final purpose of establishing a licensed geological repository.

I should mention some of our comments on the licensing process that is embodied in the bill.

The licensing process for a geological repository, more than any other element of the waste management program, will be the crucible where Federal decisions and siting choices will be tested and public confidence in the waste program will be either built or broken.

We view it as extremely unfortunate in that regard that the licensing provisions of the subcommittee draft have become almost the catch-all for a wide variety of methods to circumvent normal NRC licensing procedures. The licensing procedures that are specifically mentioned in the subcommittee draft, that is, legislative rather than adversary hearings, limitations on contentions brought by the public or local government, ex parte exemptions for the chief applicant, determination of the adequacy of an environmental impact statement to be made by the applicant rather than the decisionmaking agency, and last but not least, interim licenses for geological repositories, seems to me to be an extremely damaging way to approach the whole question of licensing of geological repositories. I say that not with any sense of vindication or pleasure, but because I think that the licensing process is really going to be the process, if it takes 3 years or if it takes 4 years, on which the American public will decide whether or not they believe the assurances of the Department of Energy and of the other Federal agencies and of the Congress that this site and this repository design that is going to be an irrevocable measure will be safe.

I think that to the extent that you lower the hurdle of the licensing process deliberately so that it is easier presumably to license a repository you also lower the validity of that test in the eyes of the American public, and I think that you court a situation in which, to the extent that elements of the public do not believe that the licensing process is a true test, that they will seek to undermine the licensing process. And I think that that is a foreseeable but sad consequence which none of us would profit from.

The last point I would like to make—my written statement delves in detail on the issues of licensing in the bill, and I don't feel any need to go into that. The last point that I would like to make is with regard to the timelines in the bill.

We think that the timelines in this bill are considerably improved, A, over the timelines for the establishment of the old T. & E. facility in the original subcommittee bill, and B, over the proposed timelines, for instance, in S. 1662, which is currently before the Senate.

On the other hand, I would have to say that I think the timeline in the bill is optimistic. I have appended three charts to my testimony which are an attempt on my part to put on a chart the actual timeline that is specified for significant decision events in your bill, and also to allow its comparison with the existing DOE projections of A, their reference schedule, which is the schedule that they think they can accomplish if they don't do in-depth or at-depth site characterization, and B, their extended duration schedule which they think is their schedule if they do do at-depth site characterization which they estimate will cost 40 months at each site.

At present your bill is very close to, and in some places slightly in advance on the timeline that they call their reference schedule.

I would like to mention three elements with regard to the timeline that I think are particularly important.

In light of the recent debate over the implementation of the Uranium Mill Tailings Radiation Control Act, I think it is unwise to provide EPA only 4 months after the date of enactment to accommodate the Congress with the issuance of their high-level waste regulations. They were requested in the Mill Tailings Act in 1978 to come through with mill tailings regulations within 18 months of the date of enactment. They were unable to do that, and in fact 3 years later they still have not issued a draft environmental impact statement on those issues. In addition, they are facing enormous budget cuts which I think will impair their ability to deal with that schedule.

I also would like to note that the requirement that three sites be selected for characterization within 1 year of enactment I believe insures virtually that DOE will be forced to ratify a site with which they are already familiar whether or not better sites are available in the research pipeline.

I know I am going on. Let me quickly summarize our recommendations, if I may, and then I would be glad to take questions.

I believe that the subcommittee should consider the need, first, for a coordinated research plan of the kind advocated in H.R. 1993.

Second, I believe that the subcommittee should considser the need for the proposed T. & E. facility in terms of the total research needs leading to a geological repository, and if the facility is deemed necessary on that kind of a measurement, I believe the subcommittee should consider locating the T. & E. facility at a site other than a potential repository site.

I would hope that the subcommittee would consider the advisability of the various restrictions on licensing and the NEPA process embodied in the draft.

I would hope that the subcommittee would consider whether the timeline in the bill poses impractical deadlines for any agency, and particularly in terms of the enforcement mechanism that is stipulated in the, I believe it is called, decision enforcement or the project decision schedule.

I also think that the subcommittee should consider whether the scope of the bill should be broadened to include nuclear waste produced by DOE in the course of weapons production and other defense related activities. Although I have not dwelled on this at length in my testimony, it is the view of the Sierra Club that the artificial distinction between military waste and civilian waste is not supportable, either in terms of the public perception of the waste problem or in terms of the pragmatic operation of the waste management problem.

Thank you very much for allowing the Sierra Club to State its views on this important issue.

[The prepared statement of Mr. Yeager follows:]

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TESTIMONY OF
BROOKS YEAGER, WASHINGTON REPRESENTATIVE
SIERRA CLUB
BEFORE THE HOUSE SUBCOMMITTEE ON
ENERGY RESEARCH AND PRODUCTION
ON H.R. 1993 AND AN UNNUMBERED DRAFT
OF THE SUBCOMMITTEE

October 7, 1981

Madame Chairman, Members of the Subcommittee:

I am grateful for the opportunity to appear before you today to discuss the Sierra Club's views on the disposal of nuclear waste materials, and in particular, our comments on H.R. 1993, the bill introduced by Mr. Lundine, and the unnumbered draft developed by the staff of the Subcommittee on behalf of the Chairman and Mr. Lujan.

The Sierra Club is an organization of more than 235,000 members dedicated to the protection and enhancement of the environment. My name is Brooks Yeager, and I am the Club's Washington Representative for Energy Policy.

The Sierra Club has consistently supported the development of comprehensive legislation to provide a statutory basis for the federal government's waste management program. During the last Congress, we worked to forge compromises necessary for the enactment of H.R. 8378, the legislation reported by the Interior Committee and the (then) Interstate and Foreign Commerce Committee, which passed the House last December 3. Although H.R. 8378 failed of final enactment, it has been re-introduced this Congress as H.R. 3809, and the Sierra Club testified in general support of the new bill before Chairman Udall's Subcommittee on Energy and the Environment on June 23 of this year.

In this context, we have been encouraged by the willingness of all three major committees in the House to attempt to negotiate some of the discrepancies in their approaches to nuclear waste legislation, and to attempt to avoid the jurisdictional problems which plagued the bill last year. There now seems to be at least a general agreement that the goal of waste legislation should be the establishment of a final geologic repository, already a step forward from the divergent views on this issue in last year's debate.

The Sierra Club specifically supports a legislative approach which would result in the licensing of a safe geological repository at a carefully chosen and publicly acceptable site, and we urge that every element of the waste legislation proposed thus far be examined with that goal in mind.

In this context, I should say that despite our disagreements with important sections of the Subcommittee draft, which I plan to go into at length, I should indicate that the Sierra Club is encouraged by the willingness of the Chairman to take a comprehensive approach to the waste problem. We are pleased to note the willingness of the Subcommittee to consider a meaningful state role in repository siting, the formulation of a fee-based waste management system, and an overall commitment to final geologic disposal in a licensed geologic repository. These are all concepts for which the Sierra Club has worked over the years, and which we continue to support.

I would like to begin my testimony today by making some general observations concerning the nuclear waste issue and then go on to some detailed analyses of specific sections of the bills under consideration. I am sorry that, because of the short time period in which I have had the Subcommittee draft for review, my comments cannot be as complete as I would like.

Nuclear Wastes--Confidence and Consensus

The question which the unsolved problem of nuclear waste poses to our society comes in two parts--one part being technical and the other political and institutional. It is our firm belief that the mere existence of various techniques for storing or disposing of nuclear waste constitutes at best only half of the solution to the problem.

Despite the many technical questions which remain to be resolved, there appears to be a general consensus within the technical and scientific community that nuclear wastes can be safely and finally disposed of, and that the way to do so is by interring them in a deep geological repository. Yet even within the scientific community, it is clearly perceived that remaining questions which must be answered prior to the development of a repository include important problems such as the completion of a systematic geological examination and characterization of media other than salt, including basalt, shale, crystalline rocks, and zeolitic tuff, the effective characterization of groundwater flow paths around potential repositories, and the further study of the thermal mechanical behavior of proposed host rocks (Cf. Geologic Disposal of High-Level Radioactive Wastes--Earth-Science Perspectives, U.S. Geological Survey, 1979).

We believe that these and other important questions can be resolved, given the resolve and the resources to do so, and a program timeline for the establishment of waste repositories which is structured so as to allow adequate time for the necessary research to be accomplished.

We hold considerably less confidence in the resolution of the many outstanding institutional problems which affect the waste management program. Historically, waste management has held a low priority in the federal nuclear effort, receiving scant attention particularly during the days of the Atomic Energy Commission. In addition, early waste management practices of both the AEC and the military left a great deal to be desired, both in terms of safety and of responsiveness to public concern.

During the Carter Administration, a considerable effort was made to rectify the situation through the establishment of the Interagency Review Group and the formulation of a comprehensive waste policy. Although there were specific areas where we disagreed with the conclusions of the Carter policy, we continue to feel that it was an important step forward in the sense that it recognized the depth of the technical and institutional problems that needed resolution and avoided a "quick fix" approach that could only end in the failure of the program and in possible tragedy.

Largely as a result of this history, the question of confidence has become increasingly important in the debate over waste management. Several states currently have laws on the books which restrict the siting of new nuclear power plants until such time as there is reasonable assurance that nuclear wastes can be effectively and finally disposed of.

More particularly, as the result of the decision of the United States Court of Appeals in State of Minnesota vs. NRC, the Nuclear Regulatory Commission, in November, 1979, began a rulemaking on The Storage and Disposal of Nuclear Waste, known as the Waste Confidence Proceeding. The purpose of the proceeding is to determine whether there exists "reasonable assurance" that nuclear waste can be safely disposed of.

The point to be made about the waste confidence proceeding is that this "reasonable assurance" which is so vital to the further development of the commercial nuclear industry in the United States, has been shown to depend primarily on the level of confidence which exists in the program which DOE has developed to site and license a geological waste repository. The key questions, that is, have not been questions of technique, but of institutional capability. Among these, the ability of the executive branch to coordinate consistent policy which would maintain continuity from one administration to the next, the ability of the program to weather key NEPA and licensing tests, and the resolution of questions regarding the role of state and local governments in the decision-making process have been some of the most important.

A great deal of this new emphasis on confidence or lack of confidence in the federal program is shaped by the politics of siting a waste repository. Many people who are willing to accept the government's assurances that the technical questions regarding geologic disposal can be resolved are not correspondingly convinced that the government will be able to make the long-term effort necessary to find and license an acceptable site for such a repository. The history of Project Salt Vault, which Dr. William Hambleton, the Director of the Kansas Geological Society, has referred to in earlier hearings before this Subcommittee, is one reason for popular hesitancy on this question. In that case, the premature choice of a site which proved to be inadequate caused lingering public doubt and controversy and set the geological disposal program itself back almost five years. Another unfortunate siting choice like the one at Lyons, Kansas would, in our opinion, cause a firestorm of public questions and could severely damage the government's ability to site a waste repository during our lifetime.

Thus, in addition to questions of technical feasibility, cost, and general adequacy in terms of safety, the bills before the Subcommittee today must be measured on two scales: do they provide a goal and a program which inspire public confidence in the eventual safety of the Department's solution to the waste problem; and do they provide a process through which that program can be effectively tested, and public confidence confirmed?

I believe the answer to both these questions is that, while each bill contains some elements of a good program, neither bill provides an adequate basis for real confidence on the part of the American people that the waste problem will be resolved in a safe and acceptable manner.

The public cannot be expected to accept the uncertainties that are inevitably present in any proposed "solution" to the waste problem unless it is clear that the institutional process will provide an accurate and straightforward test of the safety and validity of the program. To the extent that proposed legislation attempts to short-circuit key environmental and licensing reviews, as does the Subcommittee draft, both the public's confidence and the integrity of the process itself will inevitably be eroded.

Neither can the public be expected to accept the mere legislative declaration that all relevant technical issues have been resolved, as a substitute for the tangible and methodical research program which is clearly necessary. Proposed legislation which ignores this need and instead formulates a research program which is largely irrelevant to the resolution of key technical questions places the entire waste management program at a serious disadvantage.

Nuclear Waste Research

This Committee, because of its preeminent role in governing the federal research effort, has an extremely important part to play in the development of comprehensive nuclear waste legislation. In our view, that role would be to craft statutory guidelines for the research necessary to site and license a safe geological repository. Although both H.R. 1993 and the Subcommittee discussion draft address this issue at some length, neither bill is completely successful in its approach to this problem, for reasons which I will discuss.

Sec. 101 of H.R. 1993 requires, as part of the preparation of the so-called "Mission Plan," that the Department of Energy make a formal assessment of the technical and scientific questions which remain to be resolved prior to the siting of a repository, and establish a schedule for the research necessary. Such an assessment and schedule would indeed be welcome, and could largely be accomplished through the long-awaited third revision of the Department's Earth Science Technical Plan. However, even without such a coordinated assessment, many of the research needs have already been noted in various reports and submissions, not only from the Department of Energy, but from other concerned agencies, including the U.S. Geological Survey.

It is disappointing that both H.R. 1993 and the Subcommittee draft direct the Department into a research role involving the construction of facilities of dubious relevance rather than the completion of ongoing research programs in various critical areas. The so-called "T&E Facility" is a prime case in point.

It is a disturbing exercise to compare the T&E Facility which is described in the Subcommittee draft with the T&E Facility has been called for by various spokesmen for the Administration. Despite the fact that they carry the same name and would both be sited at a potential repository site, the two facilities seem to have radically different research purposes.

Specifically, the Subcommittee's T&E Facility seems to be a hybrid which combines elements of a demonstration repository with tests designed to accomplish an advanced form of site characterization utilizing radioactive materials. Although some of the tests required by the draft may in fact be worthwhile elements of an overall research program, one must question whether accomplishing them through the creation of a proto-repository at a potentially licensable site advances or detracts from the effort to license a final geological repository.

The Administration, on the other hand, has testified that the kinds of tests it feels justify the creation of a T&E Facility are not site-specific and would not contribute to the in-depth characterization of a potential site. Instead, the current thinking at the Department of Energy seems to be that a small-scale research facility is needed in which to explore generic issues related to the logistics of waste emplacement and other engineering problems that would be common to all repositories, regardless of site. Thus Kenneth Davis, the Deputy Secretary, testified before the Energy and Environment Subcommittee on July 9:

> The purpose of the test and evaluation facility...is not for extended site characterization at a favored site; this will continue at all three sites in parallel, in any event. The test and evaluation facility will develop waste emplacement technology; this technology will be used in the licensing process whether or not the first waste repository is located at the site of the test and evaluation facility.

The site of the T&E Facility, in Mr. Davis' view, is irrelevant to its purpose. The thinking seems to be that if you site it at a potential repository site, you stand a one-in-three chance of at least saving a portion of the hundreds of millions of dollars which would be expended in developing the facility, but otherwise there is very little difference.

However, if you accept the Administration's professed view as to the purpose of this facility, there seems very little point to the long list of prescribed tests in the Subcommittee draft, and even less point in siting the facility at a potential repository site.

There is little point to the tests for two reasons: the first being that the consensus of technical opinion is that emplacement of radioactive wastes is not necessary for in-depth site characterization, and the second being that the timeline specified for the operation of the T&E Facility in the Subcommittee's draft is far too short for the results of such tests to have any bearing on the licensing of the first repository.

In regard to the first point, I would note the testimony of Dr. Paul Witherspoon before the Energy and Environment Subcommittee earlier this year. Dr. Witherspoon was asked whether, in terms of site-specific knowledge, anything was to be gained from the emplacement of radioactive wastes. He replied:

> I do not think so, Mr. Chairman. The point that I believe needs to be resolved is the thermal mechanical behavior of the whole rock mass. The effects of radioactivity are very low so they do not enable you to get at the total picture and as I indicated the costs go way up if you try to put radioactive waste canisters underground as opposed to electric heaters.

In fact, there may be serious disadvantages to siting a T&E Facility at a potential repository site, disadvantages which would outweigh the 33% chance at saving some millions of dollars which seems so attractive to the Administration.

These disadvantages include: (a) the potential for physical damage to the repository site posed by the "failure mode" tests required by the Subcommittee draft, which include "in situ tests under normal repository conditions to establish the effect of the failure of waste packages and gross release of radionuclides into surroundings..."; (b) the potential for prejudicing the licensing of the actual repository, if established at the same site, because of the institutional and monetary investment in the success of the T&E Facility; and (c) the potential damage to the public trust posed by the establishment of a facility which is indistinguishable from a repository in the public eye, but which is not subject to NRC licensing, NEPA, or state role requirements.

In addition to these disadvantages, the siting of the T&E Facility on the timeline proposed in the Subcommittee draft would virtually insure that no information developed from the in situ tests would be available in time to be used during the licensing proceeding for the first repository, thus invalidating any claim for the site-specific research advantages of the facility.

If, after a coordinated assessment of the kind required in H.R. 1993 were made, the Subcommittee agreed with the Department that the construction of a research facility was necessary in order to attain valuable generic information with regard to the logistics of waste emplacement and related engineering matters, such a facility could be co-located with the existing Climax Test Facility at the Nevada Test Site.

In our view, the expansion of Climax or another existing test site in order to make these tests would save money and time for the Department, without posing the danger of contaminating or prejudicing a potential repository site. More importantly, using an existing test facility would avoid raising the specter of unlicensed de-facto repositories in the mind of the public.

Both bills recommend the establishment of other R&D facilities which, in our view, are largely peripheral to the federal waste management problem. In particular, the program advocated in the Subcommittee draft for dry storage in underutilized federal facilities, and H.R. 1993's recommendation for further research in reprocessing technology, fall into this category.

The Licensing Process and Public Perception

The licensing process, more than any other element of the waste management program, will be the crucible where federal decisions and siting choices will be tested and public confidence in the waste program and in a particular site and design either built or broken.

It is extremely unfortunate, therefore, that the licensing provisions of the Subcommittee draft have become a catch-all for a wide variety of methods to short-cut, circumvent, or avoid the demands of a rigorous licensing procedure. I would have to say that these licensing provisions--legislative rather than adversary hearings, limitations on contentions brought by the public or local government, *ex parte* exemptions for the chief applicant, determination of the adequacy of an environmental impact statement to be made by the applicant rather than the decision-making agency, and, last but not least, interim licenses for geologic repositories--resemble a kind of wish list which might be prepared for all licensing actions by the nuclear industry. What they clearly do not resemble is the kind of licensing procedure which would provide a convincing demonstration to the public at large of reasons for confidence in a particular site, repository design, or the DOE program in general.

These licensing provisions are reminiscent of a hurdler, who, worried whether he can run a new track record, decides that no amount of training will achieve certainty and that the only thing to do is to lower the height of the hurdles.

I would like to touch on a few specific points:

1. The requirement in Sec. 7(b)2 that the Commission consider the application "only on the basis of protecting the public health and safety," is unclear, but presumably prohibits the consideration of any other environmental impacts. If so, this could prohibit the consideration of impacts on groundwater where groundwater is not a source of public drinking water, or of impacts on wildlife. In addition, such a restriction would render meaningless the Commission's review under NEPA.
2. The provision in Sec. 7(d) that the Commission may consider an application for "all or part" of a repository could lead to the kind of legal jungle that only the fittest lawyers could survive. How could a local government or other intervenor address the safety of part of a repository? In addition to being confusing, such a part-by-part consideration contradicts the basis "systems" approach which has been a basis for DOE repository planning for more than five years.
3. Sec. 7(d)2, which outlines a two-level hearing, in which most issues will be considered in a legislative-style hearing, and only contentions which meet extremely strict criteria, or disputes of fact which meet similarly high criteria, will be admitted to an adjudicatory hearing must be seen as basic and unwelcome amendments to Section 189 of the Atomic Energy Act. The Commission has always construed Sec. 189 as a right to an adjudicatory hearing, but now this section would be reinterpreted to offer concerned citizens or local governments only a rulemaking, and to require them to meet nearly impossible demands before being granted a hearing.

   Legislative hearings of the type prescribed in the Subcommittee draft offer the licensing board no true basis for a decision. There is no opportunity for direct rebuttal or cross-examination of witnesses and thus no development of the kind of record on which the board could rely in exploring the issues under dispute. One can only be frightened at the prospect of licensing a permanent high-level waste repository on the basis of the same kind of hearing at which the local school board decides to close the neighborhood elementary school.

4. There does not seem to be any legal precedent for the extreme barrier which Sec. 7(d)(3) would place before any issue could be admitted to the adjudicatory section of the hearing. The licensing board would have to decide a minimum of ten questions concerning the status of any issue or contention before making a determination whether an adjudicatory hearing on that issue is warranted. Given the fact that the number of disputed issues in a licensing process as complex as the one under discussion is likely to be quite high, some experts have estimated that this decision process alone could cost the board between six months and a year.

5. The limitation on the ability of the licensing board to raise any contention _sua sponte_ (Sec. 7(d)(5)) is clearly a holdover from recent debates on reactor licensing. Again, given the unique character of the first licensing proceeding for a permanent waste repository, such a limitation seems ill-advised.

6. The limitation on contentions (Sec. 7(d)(6)), which again seems to be drawn from language that was heavily criticized when offered by the Appropriations Committee in the context of reactor licensing, would prohibit the licensing board from accepting contentions offered by anyone but the State Government, unless the contention was supported by a "prima facie evidentiary showing of substantial and specific facts... supported by affidavits of persons having actual knowledge of the facts therein."

   This restriction would make it almost impossible for a local government or other concerned party to present acceptable contentions to the board. Although current interpretation calls for the presenting of a substantial factual basis for a contention, it is generally acknowledged that much of the information on which the argument for the contention will be based must still be brought out through the processes of discovery and cross-examination. This is true not only in licensing actions before the NRC, but in most adjudicatory hearings of any kind.

The restriction on contentions therefore confuses the process of stating a contention with that of discovery. In addition, it contradicts the implicit presumption of the earlier restriction on sua sponte contentions, which must be that all valid contentions will be brought out by the parties to the proceeding. The restrictions are ironically double-barreled--not only is the licensing board prevented from considering contentions not brought by a party, but the parties are prevented from bringing contentions which they have not already proved.

7. Sec. 7(d)(7) apparently requires DOE to complete construction of repository facilities within eight years of the submission of the license application, whether or not the Commission has ever issued a construction authorization for the facility.

8. Similarly, the bill apparently requires the Commission to grant a license within eight years of application, no matter what decision the licensing board may make with regard to the site or the design of the repository. It is not clear what the purpose of the licensing hearing is if the result is foreordained.

9. Sec. 7(d)(7)(c) would prevent the presentation of any new facts learned during the process of constructing the facility at the hearing for an operating license.

10. The exemption on ex parte communications contained in Sec. 7(d)(8) would cover not only DOE, i.e., the principal applicant before the Commission, but also virtually any other federal official, thus opening a wide door to extraordinary communications and even pressures on the Commission, none of which would be available for inspection on the public record.

11. Sec. 7(d)(9) provides for the consideration of the application on the basis of an Environmental Impact Statement prepared solely by the appli-

cant, the adequacy of which is under the sole control of the applicant. This certainly represents a novel interpretation of NEPA, which has normally vested final responsibility for the environmental impact statement in the decision-making agency, i.e., the Commisssion.

12. Finally, Sec. 7(d)(9)(B) provides for interim licenses for permanent geologic repositories, a concept which seems wholly out of place in this setting. The inclusion of interim licensing for nuclear reactors in current legislation was based on a long debate concerning alleged delays in licensing reactors that were projected to complete construction in advance of the projected completion of licensing hearings. To my knowledge, there has been no such debate, nor any such projections, concerning repositories. Such an interim repository license, if it ever were granted, would in my estimation do more to damage the credibility of the Commission as a regulatory body than it would to enhance the credibility of the repository as a safe project.

Licensing provisions such as these proposed in the Subcommittee draft can only have the opposite effect to what is intended by the authors--rather than strengthening the integrity of the program, they will weaken it, rather than expediting the siting of a repository, they will very likely encourage an atmosphere of distrust in which it will be delayed, rather than confirming the confidence of the public by speeding through a smoothed-out licensing process, they will destroy that confidence by emasculating the institutional safeguards on which it depends. I would urge you to abandon these provisions before marking up the legislation.

Timeline for Site Selection and Repository Licensing

Finally, I would like to make some comments on the timeline proposed for site selection and other agency actions in the Subcommittee draft, and specifically on the Project Decision Schedule proposed to help agencies meet their deadlines.

The most important quality which any legislatively mandated timeline for site selection can have is realism. A timeline which, for instance, mimicked the six-year timeline for siting a first repository which is a major part of S. 1662, would ignore the realities and technical needs of the waste management program, and could only convince a skeptical public that indeed, expediency and not safety is the highest priority in terms of waste disposal.

I have appended three charts to my testimony comparing the site selection timeline contemplated by the Subcommittee draft with the "reference schedule" projected by DOE in its statement of position in the Waste Confidence Proceedings, and also to the "extended duration" schedule projected by DOE as part of the same document. I think the comparison shows, that while the timeline in the Subcommittee draft is hardly of the imaginary variety found in the Senate bill, it is highly optimistic.

Within this generally optimistic timeline, there are individual elements which are of particular concern:

1. In light of the recent debate over the implementation of the Uranium Mill Tailings Radiation Control Act, in which the Environmental Protection Agency has failed, in three years, to even begin the process of standard setting which the Act mandated to be completed in 18 months, the requirement in Sec. 9(b) that EPA set high-level waste standards within four months of the date of enactment is, to say the least, highly suspect. If one takes into consideration the enormous budget cuts purportedly proposed for the Agency in its FY 1983 request to OMB, the 4-month deadline becomes ludicrous.

2. The requirement in Sec. 5(b) that three sites be selected for characterization within one year of enactment virtually insures that DOE will be forced to ratify sites with which they are already familiar, whether or not better sites are available in the pipeline.

3. The legislative definition in Sec. 9(a)(2) would exclude any requirement for the preparation of environmental impact statements for EPA's High-Level Waste Standards, for DOE's site selection guidelines, for

NRC's High-Level Waste Regulations and any associated technical criteria, for the excavation of, or the emplacement of radioactive waste in the T&E Facility, and for the sinking of shafts or the in-depth characterization of any site.

Conclusions and Recommendations

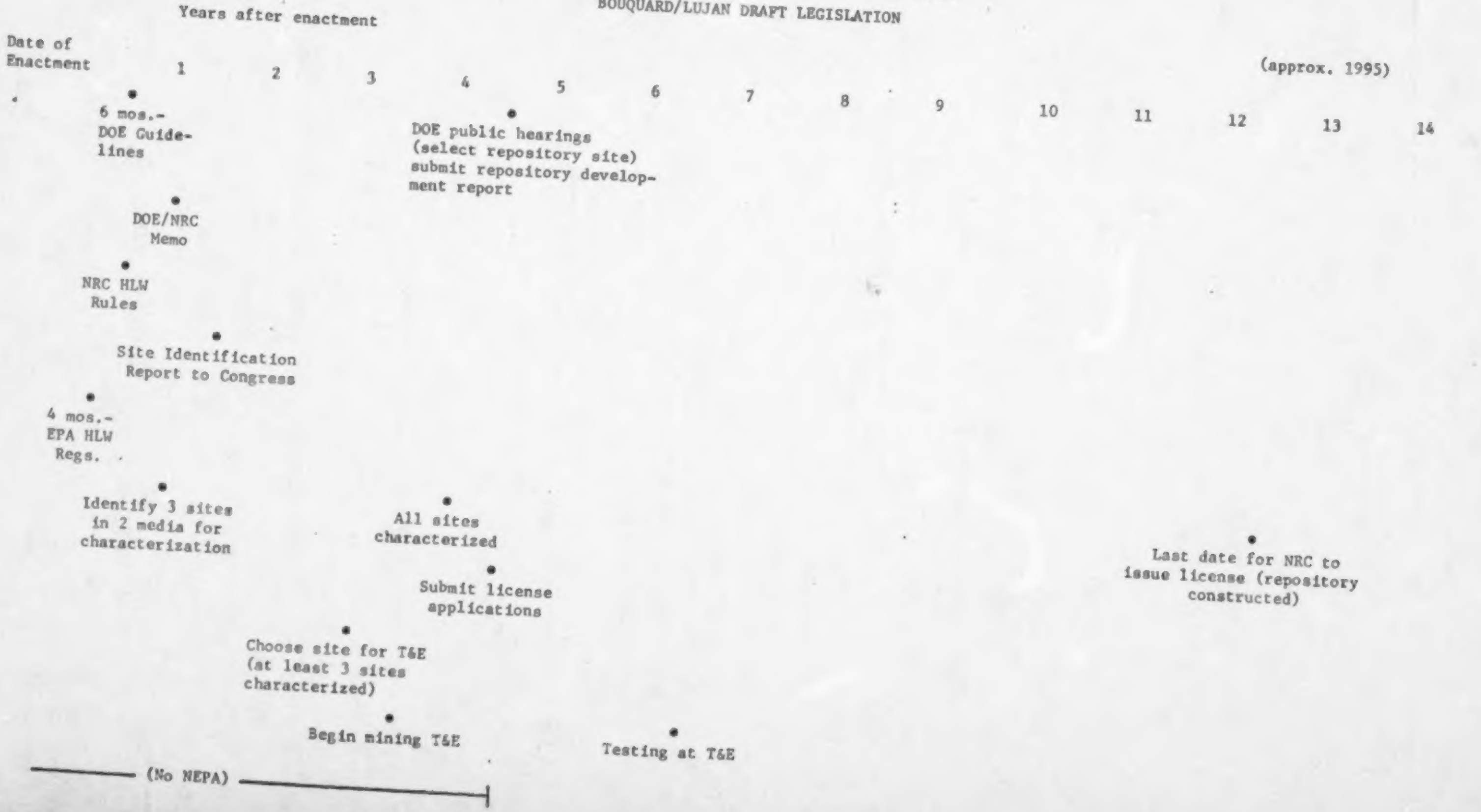
This concludes our analysis of the bills before the Subcommittee. In looking forward to a Subcommittee mark-up, we would like to make the following recommendations:

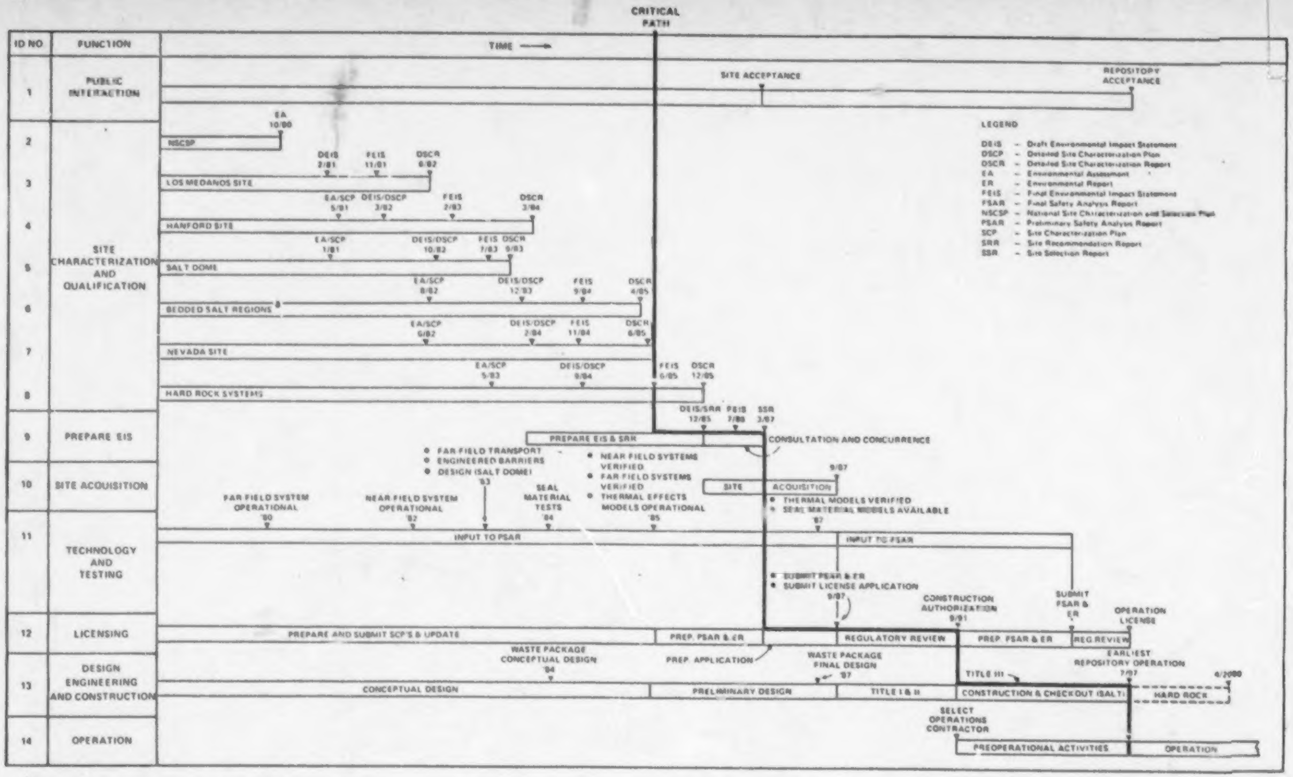
1. The Subcommittee should consider the need for a coordinated research plan of the kind proposed in H.R. 1993. Statutory guidelines for research activities of the Department and other federal agencies should be guided by the goal of resolving the outstanding earth science and related technical issues which stand in the way of the successful development of a safe geological repository.
2. The Subcommittee should reconsider the need for the proposed T&E Facility in terms of the total research needs of the program. If the facility is deemed necessary for the resolution of generic issues, the Subcommittee should consider locating the proposed T&E Facility at an existing test site rather than at the site of a potential repository.
3. The Subcommittee should consider the advisability of the various restrictions on the licensing and NEPA processes embodied in the draft. Our recommendation would be that all such restrictions should be eliminated.
4. The Subcommittee should consider whether the timeline in the bill poses impracticable deadlines for the agencies involved, and should amend such deadlines to make the decision mechanisms in the bill more realistic.
5. The Subcommittee should consider whether the scope of the bill should be broadened to include nuclear wastes produced by DOE in the course of weapons production or other defense-related activities. It is the view of the Sierra Club that the artificial distinction made in the current draft is insupportable, both in terms of the public perception of the waste problem, and in terms of the pragmatic operation of the waste management program.

Thank you once again for the opportunity to state the views of the Sierra Club on this important issue.

October 7, 1981

TIMELINE FOR SELECTING GEOLOGICAL REPOSITORY
BOUQUARD/LUJAN DRAFT LEGISLATION


Years after enactment
Date of Enactment
1
2
3
4
5
6
7
8
9
10
11
12
13
14
(approx. 1995)
6 mos.- DOE Guide-lines
DOE public hearings (select repository site) submit repository development report
DOE/NRC Memo
NRC HLW Rules
Site Identification Report to Congress
4 mos.- EPA HLW Regs.
Identify 3 sites in 2 media for characterization
All sites characterized
Last date for NRC to issue license (repository constructed)
Submit license applications
Choose site for T&E (at least 3 sites characterized)
Begin mining T&E
Testing at T&E
(No NEPA)

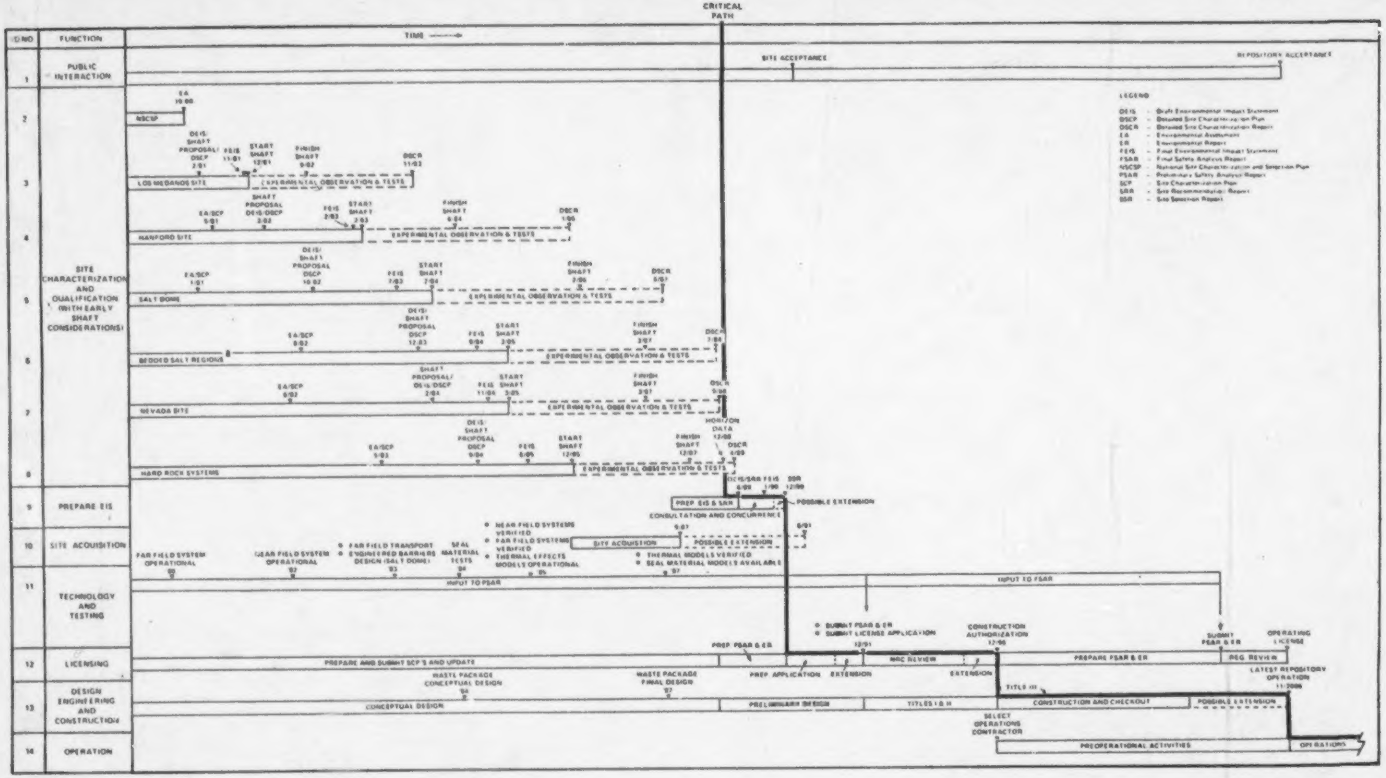

CRITICAL PATH
ID NO
FUNCTION
TIME ⟶
1
PUBLIC INTERACTION
SITE ACCEPTANCE
REPOSITORY ACCEPTANCE
LEGEND
DEIS – Draft Environmental Impact Statement
DSCP – Detailed Site Characterization Plan
DSCR – Detailed Site Characterization Report
EA – Environmental Assessment
ER – Environmental Report
FEIS – Final Environmental Impact Statement
FSAR – Final Safety Analysis Report
NSCSP – National Site Characterization and Selection Plan
PSAR – Preliminary Safety Analysis Report
SCP – Site Characterization Plan
SRR – Site Recommendation Report
SSR – Site Selection Report
2
NSCSP
EA 10/80
3
LOS MEDANOS SITE
DEIS 2/81
FEIS 11/81
DSCR 6/82
4
HANFORD SITE
EA/SCP 5/81
DEIS/DSCP 3/82
FEIS 2/83
DSCR 3/84
5
SITE CHARACTERIZATION AND QUALIFICATION
SALT DOME
EA/SCP 1/81
DEIS/DSCP 10/82
FEIS 7/83
DSCR 9/83
6
BEDDED SALT REGIONS a
EA/SCP 8/82
DEIS/DSCP 12/83
FEIS 9/84
DSCR 4/85
7
NEVADA SITE
EA/SCP 6/82
DEIS/DSCP 2/84
FEIS 11/84
DSCR 6/85
8
HARD ROCK SYSTEMS
EA/SCP 5/83
DEIS/DSCP 9/84
FEIS 6/85
DSCR 12/85
9
PREPARE EIS
PREPARE EIS & SRR
DEIS/SRR 12/85
FEIS 7/86
SSR 3/87
CONSULTATION AND CONCURRENCE
10
SITE ACQUISITION
SITE
ACQUISITION
9/87
11
TECHNOLOGY AND TESTING
FAR FIELD SYSTEM OPERATIONAL '80
NEAR FIELD SYSTEM OPERATIONAL '82
• FAR FIELD TRANSPORT
• ENGINEERED BARRIERS
• DESIGN (SALT DOME) '83
SEAL MATERIAL TESTS '84
• NEAR FIELD SYSTEMS VERIFIED
• FAR FIELD SYSTEMS VERIFIED
• THERMAL EFFECTS MODELS OPERATIONAL '85
• THERMAL MODELS VERIFIED
• SEAL MATERIAL MODELS AVAILABLE '87
INPUT TO PSAR
INPUT TO FSAR
• SUBMIT PSAR & ER
• SUBMIT LICENSE APPLICATION 9/87
CONSTRUCTION AUTHORIZATION 9/91
SUBMIT FSAR & ER
OPERATION LICENSE
12
LICENSING
PREPARE AND SUBMIT SCP'S & UPDATE
PREP. PSAR & ER
REGULATORY REVIEW
PREP. FSAR & ER
REG REVIEW
13
DESIGN ENGINEERING AND CONSTRUCTION
WASTE PACKAGE CONCEPTUAL DESIGN '84
PREP. APPLICATION
WASTE PACKAGE FINAL DESIGN '87
CONCEPTUAL DESIGN
PRELIMINARY DESIGN
TITLE I & II
TITLE III
CONSTRUCTION & CHECKOUT (SALT)
EARLIEST REPOSITORY OPERATION 7/97
4/2000
HARD ROCK
14
OPERATION
SELECT OPERATIONS CONTRACTOR
PREOPERATIONAL ACTIVITIES
OPERATION

[a] Bedded salt regions other than Los Medanos.

Figure III-2. Summary Logic Network Activities Leading
to Geologic Repository Operation
(Reference Schedule)

SOURCE: STATEMENT OF POSITION OF U.S. DEPT. OF ENERGY
IN THE MATTER OF PROPOSED RULEMAKING ON THE STORAGE AND DISPOSAL
OF NUCLEAR WASTE)) PR-50,51 (44 FR61372)

SOURCE: STATEMENT OF POSITION OF U.S. DEPT. OF ENERGY IN THE MATTER OF PROPOSED RULEMAKING ON THE STORAGE AND DISPOSAL OF NUCLEAR WASTE PR-50,51 (44 FR61372)


CRITICAL PATH
ID NO
FUNCTION
TIME ——→
1
PUBLIC INTERACTION
SITE ACCEPTANCE
REPOSITORY ACCEPTANCE
2
SITE CHARACTERIZATION AND QUALIFICATION (WITH EARLY SHAFT CONSIDERATIONS)
NSCSP
EA 10/80
3
LOS MEDANOS SITE
DEIS/ SHAFT PROPOSAL/ DSCP 2/81
FEIS 11/81
START SHAFT 12/81
FINISH SHAFT 9/82
DSCR 11/83
EXPERIMENTAL OBSERVATION & TESTS
4
HANFORD SITE
EA/SCP 5/81
SHAFT PROPOSAL DEIS/DSCP 2/82
FEIS 2/83
START SHAFT 2/83
FINISH SHAFT 6/84
DSCR 1/86
EXPERIMENTAL OBSERVATION & TESTS
5
SALT DOME
EA/SCP 1/81
DEIS/ SHAFT PROPOSAL DSCP 10/82
FEIS 7/83
START SHAFT 2/84
FINISH SHAFT 2/86
DSCR 6/87
EXPERIMENTAL OBSERVATION & TESTS
6
BEDDED SALT REGIONS a
EA/SCP 8/82
DEIS/ SHAFT PROPOSAL DSCP 12/83
FEIS 9/84
START SHAFT 3/05
FINISH SHAFT 3/07
DSCR 7/08
EXPERIMENTAL OBSERVATION & TESTS
7
NEVADA SITE
EA/SCP 8/82
SHAFT PROPOSAL/ DEIS/DSCP 2/84
FEIS 11/04
START SHAFT 3/05
FINISH SHAFT 3/07
DSCR 9/08
EXPERIMENTAL OBSERVATION & TESTS
8
HARD ROCK SYSTEMS
EA/SCP 5/03
DEIS/ SHAFT PROPOSAL DSCP 9/04
FEIS 6/05
START SHAFT 12/05
FINISH SHAFT 12/07
HORIZON DATA 12/08
DSCR 4/09
EXPERIMENTAL OBSERVATION & TESTS
9
PREPARE EIS
DEIS/SRR 6/09
FEIS 1/90
SSR 12/90
PREP EIS & SRR
CONSULTATION AND CONCURRENCE
POSSIBLE EXTENSION
10
SITE ACQUISITION
9/87
SITE ACQUISITION
POSSIBLE EXTENSION
6/91
11
TECHNOLOGY AND TESTING
FAR FIELD SYSTEM OPERATIONAL '80
NEAR FIELD SYSTEM OPERATIONAL '82
• FAR FIELD TRANSPORT
• ENGINEERED BARRIERS DESIGN (SALT DOME) '83
SEAL MATERIAL TESTS '84
• NEAR FIELD SYSTEMS VERIFIED
• FAR FIELD SYSTEMS VERIFIED
• THERMAL EFFECTS MODELS OPERATIONAL '85
• THERMAL MODELS VERIFIED
• SEAL MATERIAL MODELS AVAILABLE '87
INPUT TO PSAR
INPUT TO FSAR
12
LICENSING
PREPARE AND SUBMIT SCP'S AND UPDATE
PREP PSAR & ER
PREP. APPLICATION
EXTENSION
• SUBMIT PSAR & ER
• SUBMIT LICENSE APPLICATION 12/91
NRC REVIEW
EXTENSION
CONSTRUCTION AUTHORIZATION 12/96
PREPARE FSAR & ER
SUBMIT FSAR & ER
REG. REVIEW
OPERATING LICENSE
13
DESIGN ENGINEERING AND CONSTRUCTION
WASTE PACKAGE CONCEPTUAL DESIGN '84
WASTE PACKAGE FINAL DESIGN '87
CONCEPTUAL DESIGN
PRELIMINARY DESIGN
TITLES I & II
TITLE III
CONSTRUCTION AND CHECKOUT
POSSIBLE EXTENSION
LATEST REPOSITORY OPERATION 11/2006
14
OPERATION
SELECT OPERATIONS CONTRACTOR
PREOPERATIONAL ACTIVITIES
OPERATIONS
LEGEND
DEIS - Draft Environmental Impact Statement
DSCP - Detailed Site Characterization Plan
DSCR - Detailed Site Characterization Report
EA - Environmental Assessment
ER - Environmental Report
FEIS - Final Environmental Impact Statement
FSAR - Final Safety Analysis Report
NSCSP - National Site Characterization and Selection Plan
PSAR - Preliminary Safety Analysis Report
SCP - Site Characterization Plan
SRR - Site Recommendation Report
SSR - Site Selection Report

ᵃBedded salt regions other than Los Medanos.

Figure III-3. Summary Logic Network Activities Leading to Geologic Repository Operation
(Extended duration for characterization, licensing, and construction)

Mrs. BOUQUARD. Thank you very much, Mr. Yeager, for presenting your views. I know that this subcommittee has reached totally different conclusions than the Sierra Club on a number of important issues, but that does not at all detract from the importance of receiving and understanding the divergent views on this nuclear waste issue.

I would like to examine two issues that you presented and then perhaps submit additional questions in writing, if that is agreeable to you, sir.

On page 5 of your testimony you stated that the Bouquard/Lujan proposal tends to short-circuit key environmental and licensing reviews. On our chart I think we bring this out, as it was in the bill, that we do have the requirements—I hope you are familiar with them—for environmental assessment reports prior to site characterization and prior to T. & E. facility construction and the requirements for the preparation of environmental impact statements prior to site selection and prior to emplacing radioactive materials in the R. & D. facility.

Would you care to comment on that?

Mr. YEAGER. Well, I think that there are two comments I would make. No. 1, as I read the bill there is a clause—and I don't have a copy of the bill in front of me—that states that no action taken by any Federal agency prior to the effective selection of a site will be considered a final action for the purposes of the National Environmental Policy Act except for the exceptions which you have mentioned.

I think there are numerous decisions—well, not numerous. I think there are several decisions prior to that point which may be justifiably the subject of an environmental impact statement, and I would mention two specific things. No. 1, would be the DOE criteria and the EPA high-level waste regulations. No. 2, would be the actual process of sinking the shaft, that is, the site characterization process at a site.

I think that both those actions are worthy of a very careful environmental review of the kind that would be provided by an EIS under NEPA.

Mrs. BOUQUARD. Are you saying agencies should issue an environmental impact statement in a rulemaking procedure?

Mr. YEAGER. Well, I think that—no. I should correct that. I don't believe that that is the case, but I do believe that the criteria for the selection of repositories could constitute a very major action that should be reviewed by an environmental impact statement.

Mrs. BOUQUARD. Since my time is limited also, I am going to have to go into a final question.

Turning to page 5 of your testimony, on the question of safety reviews, are you familiar with the provisions requiring a continuous backup safety review by the NRC from the initiation of the program? In other words, they are going to be continually involved in this process. The review and consent role includes specified reviews of all environmental reports by NRC that are proposed in actual DOE activities for the R. &. D. facility. There again, NRC backs up DOE on their safety and environmental reviews from the very beginning of the project. In fact, there is a specific publication requirement for NRC concerns and DOE responses and a statutory mandate to allow NRC access to the T. & E. facility. In fact, NRC would be involved from the inception of this program, Mr. Yeager.

Mr. **Yeager**. Well, I am aware of that section. I think that I have stated the worries that I have with regard to the placement of the T. & E. facility at a potential repository site. I don't think that those concerns are allayed by the continual involvement which is required with NRC. One of the major issues with regard to a T&E facility, in my view, is whether in the process of selecting a repository it is inevitable that a T. & E. facility may be transformed from a sort of larval repository into a full-blown butterfly in which the momentum is so strongly on the side of the—out of three sites. You characterize three sites. But one of them has $300 million or $200 million worth of rather extraordinary research investment in a facility which could be patterned on and could be expanded into a full-fledged repository. I think that that sort of momentum established at a repository site makes it extremely unlikely that either one of the other two sites would in fact be chosen as the licensable site for a repository.

Mrs. **Bouquard**. How would you deviate from this?

Mr. **Yeager**. As I suggested in my testimony, if you were to decide that the T. & E. facility was a necessary research facility, I would propose locating it at an existing research facility. One could mention either the Nevada Test Site, Climax facility, at which the shaft is already present, or something that could be erected at Hanford near the Near Surface Test Facility.

Mrs. **Bouquard**. Thank you very much.

Mr. Lundine.

Mr. **Lundine**. Thank you, Madam Chairman.

Would you agree that two elements very important to the establishment of a credible, comprehensive nuclear waste management program are, first of all, a plan that I would characterize as an action plan that is agreed on by both the Congress and the administration then in power, and second, a designated means to finance the implementation of that plan?

Mr. **Yeager**. With qualifications, yes, I would agree. The qualification would be that I think that it is more important for Congress to provide a very clear underlying direction specifically toward a licensed geological repository than it is for Congress to line item every detail that needs to be accomplished in order to get there.

Mr. **Lundine**. I think your testimony has been very clear on that point. One thing I would like to bring out is that we always talk about our differences. I guess we tend to do that.

Mr. **Yeager**. I assume that is why you called the Sierra Club.

Mr. **Lundine**. On the other hand, I think your initial testimony about how far we have come in meeting some of these things such as self-financing, and here we had the industry here yesterday testifying in support of that, suggests that some progress is being made.

Mr. **Yeager**. Absolutely. I think a great deal of progress has been made.

Mr. **Lundine**. Your testimony on page 4, in the middle, about the key institutional questions, I think, though, does again support the idea that some kind of an agreed upon plan that probably will survive changes in administrations and that kind of thing is a critical factor. Would you not agree?

Mr. **Yeager**. Yes, in that form, I would agree.

Mr. **Lundine**. Now I would like to get up to where we have a difference. On page 6 of your testimony you say both H.R. 1993 and the subcommittee draft direct the Department into a research and development role involving the construction of facilities of dubious relevance, and so on. I think a careful reading of H.R. 1993 would lead you to believe that it does not direct but it only permits the Secretary to do that, and second, that it must be related to what we call a mission plan in 1993. Do you take a different interpretation of that bill?

Mr. **Yeager**. No, but I think that the—I would prefer to see a bill in which the direction was clearly stated in terms of the necessary resolution of pending earth science technical questions. In fact, neither bill seems to take that as its starting point. I understand that your bill does not direct immediately any particular facility or any particular research plan and that it depends on the ratification of the mission plan in order to do that. In the current atmosphere, in regard to the folks downtown, it is clear that they want to build a facility; that that is the way they would like to spend a great deal of their research money, and we quarrel with that presumption and would therefore urge Congress in fact to direct them to solve the problems which need to be solved.

Mr. **Lundine**. Let me get to one other at least implied criticism of the legislation I have proposed. You were discussing your preference for locating any research facility at an existing site. I would point out to you that in section 102 of H.R. 1993 it says "In designating sites for repositories under this section, the Secretary shall give preference to sites on which facilities of the Department of Energy are located."

Mr. **Yeager**. Pardon me. Is that for designated repositories or research facilities?

Mr. **Lundine**. Research facilities.

Mr. **Yeager**. Thank you.

Mr. **Lundine**. So it would be fair to suggest that at least we have offered that as a preference.

Mr. **Yeager**. Yes.

Mr. **Lundine**. Thank you.

Mrs. **Bouquard**. Thank you very much, Mr. Lundine.

Mr. Lujan.

Mr. **Lujan**. Thank you, Madam Chairman.

You know, the way I viewed how we move in finally getting to a repository is that we move along on certain assumptions. Some of my assumptions are that the final repository will probably be in Hanford, in Nevada, or in Louisiana in the salt domes. Logic would tell you that we know enough about those three that that is probably where it will end up. We can punch a hole in every square yard of this whole country, but in all probability that is where they will end up. Also, trying to be realistic, perhaps our time period for the initial regulations—you are probably correct that the 6 months maybe is too quick—but we are trying to say, hey, get on with the program and let's do it. They will probably come back and say we can't promulgate the regulations within 6 months. But they would probably also come back 36 months hence and say the same thing if we gave them 36 months.

Mr. **YEAGER**. I agree there should be a deadline.

Mr. **LUJAN**. We tried to recognize the political realities of the defense waste versus commercial waste. There are some that would give us a hard time in trying to get some kind of a bill passed. Plus we are saying to the utilities "you're going to finance this," and that would complicate it if we put military waste in it. No need in checking every one of the media, as you suggest, because if we find one that is acceptable, we move on.

We heard from the Department of Energy that most of the technology, while not known completely, is adequately understood. They characterized the needed research as confirmatory.

Mr. **YEAGER**. Yes, I was here for that.

Mr. **LUJAN**. That seemed kind of reasonable to me. They expect certain things to happen when there is heat.

I think the final point that I would like to make is that we are trying to move in the direction that at all times, DOE, the State, and the NRC have good communication. So we have required in the legislation that DOE enter into agreements with them, to work together as the program moves along. However, sometimes we tend to insist on so many procedural requirments that they become stumbling blocks. We have tried to take the approach that we should move at a deliberate pace. I hope that we have accomplished that.

I sat on the Joint Committee on Atomic Energy 10 years ago, and we started talking about it, and until right now there has been no real progress. And maybe we are getting a little behind, because DOE is all ready with their test and evaluation facilities and here we are coming along with a bill that more or less says do what you are doing.

Mr. **YEAGER**. I don't necessarily think it is a bad idea to give DOE a statutory basis. In fact, I think it is a very good idea to give them a statutory basis for what they are doing because what they are doing changes, and their views on what is necessary in terms of research change radically as politics changes.

My reply to a couple points you've made, I agree with you that it is not necessary to characterize every rock in the United States for repository. I would hope that in looking at a timeline for characterization the timeline is constructed so that the most promising media could be fully characterized before the repository site is chosen.

Mr. **LUJAN**. My thought is that eventually we will end up with more than one repository. So let's take these three geologic media, see which one of those three is the best and make a decision. Then, look at other sites for the second, third, and fourth.

Mr. **YEAGER**. The worry that I would have about the timeline that more or less requires DOE, as you say, to pick the sites with which they are familiar right now—Hanford, Nev., test site, the salt dome in Louisiana—is that if any of those sites or those three sites altogether for very site-specific reasons don't work out, you will find that you have bought a timeline that is going to be delayed by the entire characterization period at the next set of sites.

Mr. **Lujan**. That is correct, if it doesn't work out. My expectation is that all three of them will work out, to be very honest with you. That is my general impression, not knowing any more about it than I do. People have looked at them and have certain ideas as to how good they will be. And I agree with what you say. If all three of them didn't work out, then we are in trouble. But I don't perceive that happening.

Mrs. **Bouquard**. Thank you very much, Mr. Lujan.

Mr. Yeager, thank you for your testimony. We have a vote underway. This committee will stand in recess for about 10 minutes to make this vote, and then we will hear from Dr. Metlay.

Mr. **Yeager**. Thank you very much, Madam Chairman.

Mrs. **Bouquard**. Thank you. The subcommittee will stand in recess for about 10 minutes while we go and vote.

[Recess.]

Mrs. **Bouquard**. The hearing will now come to order.

I appreciate the indulgence and the patience of all of you who are here today.

Our next witness is Dr. Dan Metlay, professor of political science at Indiana University. We thank you for being with us today.

We welcome you. Please proceed, Dr. Metlay.

TESTIMONY OF DAN METLAY, PROFESSOR OF POLITICAL SCIENCE, INDIANA UNIVERSITY AT BLOOMINGTON

Dr. **Metlay**. I thank you very much for the opportunity today to discuss these two significant pieces of legislation.

As you may know, I am something of a last minute substitute, and so as a result I don't have any prepared testimony. However, I would like to make a brief statement and attempt to answer any questions that you may have.

Mrs. **Bouquard**. Without objection, Dr. Metlay, if you would like to submit additional testimony, we will ask that it be made a part of the record.

Dr. **Metlay**. Thank you very much.

Since I don't represent an interest group nor am I a spokesman for a Government agency, I think an appropriate way to start would be to indicate what I might offer this committee in its deliberations.

I have been basically involved as a scholar, as an academic, in the area of nuclear waste management for approximately the last 6 years. Starting in 1975 I served on a task force that the NRC set up with regard to the goals and objectives of nuclear waste management. That effort was one of the first to argue that social and institutional aspects of radioactive waste management needed to be better considered and brought out in planning and analysis.

Several years later I served as a consultant for the Office of Science and Technology Policy, and in that role played some part in helping to develop the analysis of alternative technological strategies. In that IRG report we held that a variety of sites in different geologic media had to be examined prior to selecting any one site for a repository.

And finally, this last year I prepared a working paper for the Office of Technology Assessment on the history of radioactive waste management policymaking. That paper covered the period 1950 to 1980.

So what I would like to do today is, on the basis of that involvement in the area of waste management, to reflect—and I've only had a short time to be able to prepare this—upon the bill and to offer some observations with regard to it.

Let me start out by saying that I think this committee has done an outstanding job in putting together a bill. I found the experience of reading the bill to be quite pleasant, particularly given the problems and the difficulties that were encountered last year in getting legislation out of Congress.

Mr. LUJAN. You're the best witness we've had.

Dr. METLAY. I'm not finished.

[Laughter.]

Dr. METLAY. Clearly both pieces of legislation, the draft and the H.R. 1993, are comprehensive and obviously reflect serious thought given to an ever-pressing problem.

The following provisions in their general thrust strike me as particularly significant:

First, both bills place strong emphasis on pursuing geologic disposal in mined repositories. I think that is an important step and I think that kind of a strategy is one which will find considerable support not only in the scientific community but in the country at large.

Second, both bills incorporate into law the principle that there be redundancy and diversity in the strategy for choosing sites. This was a principle which the IRG, I think, fought for and was eventually reflected in the NRC's procedural licensing regulations, and I think it is a sound contribution that this principle of redundancy and diversity be formally incorporated into law.

Third, both bills provide for in situ testing, which I think the majority of the scientific community feel is required for sound site characterization. And again, requiring this in law I think is a major step.

I think the Bouquard and Lujan proposal provides a sensible way of preventing conflicts over distinctions between civilian and military waste and prevents these conflicts from becoming obstacles to progress.

I feel that at some point further legislation clearly will be needed to develop the provisions for military waste further, but I think this legislation allows us to move ahead in the civilian area without worrying about the politics of dealing with distinctions between civilian and military waste.

However, the proposed legislation is not flawless, and the points that I would like to suggest are possible things for you to think about in refining this bill—I think some of them have been mentioned by other witnesses, but let me just add my several cents worth.

First, I have some questions about how the T. & E. facility will actually be integrated into the program, given the schedule proposed in the legislation. At least as I read that schedule, the T. & E. facility would begin operation at about the same time that a license application is submitted. Such a temporal arrangement would limit the facility's utility in providing information for the licensing application. And in this regard I would subscribe to the point made by the representative from the Sierra Club that there might be some wisdom in developing a T. & E. facility at a place like Climax or at Hanford where you could get generic logistical information. You would have this information at an earlier point in time and it could have some direct input into the licensing process.

I should add, however, that notwithstanding this concern about the timing, I strongly agree with the need for some sort of a small or intermediate scale facility. Indeed, this was a position which the IRG took, at least in the beginning, and somehow over the last few years the idea seems to have gotten less and less attention.

Second, there is also some question in my mind about the wisdom of the $3- and $10-million payoff to the States. This may create some unfortunate precedents not only in the domain of waste management, but also in other areas where noxious hazards are involved.

I think one remedy would be to specify more precisely the purposes for which these funds are to be used, and in that regard I would concur with the statement of the representative of the National Governors' Association this morning.

Finally, I am not entirely convinced that the present organizational infrastructure, centering as it does on the Department of Energy, is necessarily the appropriate one for the future. This concern arises in part because of the organizational instability which has affected the Department of Energy and its predecessors over the last 5 years. And at least from judging what I hear in the provinces, this instability is not about to end.

Finally, I think the notion of a plan is an extraordinarily important one. Under the Carter administration the Department of Energy was instructed to prepare a plan, but there seems to have been some difficulty in getting that plan out for public comment. I think a plan is an excellent idea. I would suggest, however, that, instead of writing into the legislation a great many details, Congress role should be one more of oversight and approval. Congress should direct the Department to prepare a plan, and it should approve a plan rather than provide for a plan in a legislation, setting out guidelines and target dates.

I think the virtue of this approach is that it provides greater flexibility but it still has the advantage of at holding the Department's feet to the fire better than has been the case in the past.

Once again, notwithstanding these concerns, I believe that this bill contains provisions which are a major step forward and, at least in my view, are quite consistent with the philosophy and the reasoning that lay behind the plans and the ideas of the Interagency Review Group.

Let me, as a final point, discuss what I feel is probably the most creative and innovative feature in this bill, one which, incidentally, we tried to raise in the IRG, but unsuccessfully, and this is the authorization of front-end financing for repository development. While I may quibble over some of the modalities, I think this principle is critical because it provides financial stability which will allow the program to survive the decline in its day-to-day political fortune. But there may be more significant implications to this principle which the committee might wish to explore. Let me enlarge upon that point.

I believe, based on the work that I have done for OTA, and I feel that many others will agree, that the current waste management program suffers in many quarters from a strong lack of public credibility, even a lack of legitimacy. As a consequence, it may very well be that the program does not possess the slack or the reservoir of good will which would allow it to overcome major failures in the future and to go on and correct those failures without major disruptions.

At the same time, this legislation, by establishing specific goals and milestones for the start of repository operations, makes the program more highly accountable and visible. This is good, but it also makes the program more vulnerable if those objectives are not met. This dilemma leads me to ask what would increase the likelihood of meeting those target dates such as the mid-1990's operating dates for repositories.

One strategy—and here I pick up on the dialog that Representative Lujan had just at the end of the last testimony—one strategy, I think, for fostering success would be to submit more than one site for licensing on the assumption that if you submit several sites at least one of them will pass through the licensing process unscathed. This approach would obviously require characterizing more sites than currently envisioned, but this becomes possible, and here is the linkage with the front-end financing, this characterization becomes possible because front-end financing can provide greater money, resources, and financial stability. Simply put, the resources are more likely to be there to support a wider variety of parallel efforts.

I should point out that this strategy need not be wasteful because there is a growing recognition about the desirability of regional repositories if only to minimize the transportation logistics. Moreover, I would suggest that such an approach would have some political benefits because affected States, localities, and tribal groups would see that a viable fallback exists. As a result, they may be less fearful that the final licensing decision will have its scientific integrity undermined by bureaucratic imperatives.

With this, I again thank you for the opportunity to participate and I will be happy to at least try to answer any questions you may have.

Mrs. BOUQUARD. We enjoyed having you with us, Dr. Metlay. I thank you for rearranging your schedule to be here today. I think all the members should know that he just received a copy of the bill yesterday when he flew up from Indiana. He agreed to testify on Monday. So we do appreciate your cooperation. Your perceptive testimony is certainly going to be a great help to us.

Do you believe it is going to be helpful in terms of expediting actions to have NRC closely involved in the DOE work before receiving the official license application?

Dr. METLAY. Yes. I think that is useful. I think there is, however, an image problem that both the Congress and the agencies involved need to be sensitive to. NRC, as you all know, was set up because it was an independent agency. To the extent that collaboration undermines that perception of independence in the long term whatever you may gain as a result of closer collaboration may be lost. Officials at these agencies are sensitive to that problem. But we need to recognize that NRC has to maintain its stance of independence and cannot even appear to be taken under the wing by the Department of Energy.

I think the procedural regulations which NRC has adopted go a long way in insuring that kind of independence, and I frankly hope that they get strongly enforced.

Mrs. **Bouquard**. Do you believe a consultative role is going to be helpful?

Dr. **Metlay**. As long as it doesn't degenerate into a capture of the regulators by the Department I think it will be helpful.

Mrs. **Bouquard**. The first statement that you made was that you felt we needed to work on the perception of the public, that they know that we have this capability and that we are moving forward. But to me this is one of the great features of the test and evaluation facility, that we are concerned with nuclear waste and that we certainly have to move ahead. Would you comment on that.

Dr. **Metlay**. I guess I do not entirely share the confidence of the committee that the T. & E. facility in and of itself will provide clear evidence to the public that we are moving ahead. I think a combination of things, including a T. & E.——

Mrs. **Bouquard**. In conjunction with the repository.

Dr. **Metlay**. Yes, I think that it can be very helpful. But again, I know that there needs to be that clear understanding of what information this T. & E. facility will provide, on what timely basis it will provide it, and on the other side of the coin, what it won't tell us. That is just as important to understand as what it will tell us because we won't learn a lot of things from a T. & E. facility.

Mrs. **Bouquard**. In what respect?

Dr. **Metlay**. We will not learn, for example, the far field effects of putting waste into a host rock. We won't learn about many rock mechanics effects. So there are certain things a T. & E. facility will give us an understanding about, but if I remember the arguments in the IRG, the sense was, amongst the technical people, that there were some things that a test facility simply won't tell you. I think we need to be honest with the public about that as well.

Mrs. **Bouquard**. Those are things we hope to accomplish with the full-scale repository.

Dr. **Metlay**. Right.

Mrs. **Bouquard**. Do you feel that an arbitration board is helpful, as proposed in H.R. 1993?

Dr. **Metlay**. My own personal view is that Congress probably has the more appropriate role here than an arbitration board, and so in that respect I would support more strongly the proposals in the committee draft rather than the one in 1993.

Mrs. **Bouquard**. One final question. Do you think that we need another State planning council or an interagency review group?

Dr. **Metlay**. I think a State planning council would be a very important thing to have.

Mrs. **Bouquard**. You don't think it would be overlapping with other State programs?

Dr. **Metlay**. No.

Mrs. **Bouquard**. And the Governors' Association?

Dr. METLAY. I think, from my understanding of the way the State planning councils functions, thus far it has provided a unique and important role, and I would certainly favor its continuation. I am not sure about an interagency review group, however.

Mrs. BOUQUARD. Thank you very much, Dr. Metlay.

Mr. Lundine.

Mr. LUNDINE. Thank you very much for your testimony. I think it is significant that the people had to work from their own notes. It was most cogent. They make me understand the hearings generally.

Mrs. BOUQUARD. Mr. Lundine, would you yield.

Mr. LUNDINE. Yes.

Mrs. BOUQUARD. Since I have an appointment I am going to try and keep, I would like to ask you to chair the remaining part of the hearing.

Mr. LUNDINE. Certainly.

Mrs. BOUQUARD. Thank you, Dr. Metlay.

Dr. METLAY. Thank you very much.

Mr. LUNDINE [presiding]. Your idea, which I hasten to emphasize I favor, is to give preference to an existing facility, but I am concerned about all of your recommendations which, as I understand them, are to use an existing facility for a research repository, a T. & E. or whatever you want to call the research facility, and then take several other sites and characterize them for licensing.

First, with the T. & E. facility, therefore, you won't encounter the major institutional problem of siting, I guess, at least not as much controversy as I would expect you would at other locations. First of all, aren't you increasing the possibility of great controversy over the whole program by in effect having three or four or five areas that are dubious or may be protesting your activities all at once? Second, aren't you diluting the ability of the Department of Energy to concentrate on the technical and other problems at these existing sites by having several? And finally, don't you think that the utilities who are paying into this fund might argue that you are wasting their money?

Dr. METLAY. Let me try to take them one by one, and I am not too sure I can remember all of them, so feel free to tell me.

I think you gain politically from having a T. & E. facility which is oriented toward answering questions about logistics, waste handling, and placement at a site other than a potential repository site. That information is by and large generic which if gathered quickly will help in the licensing process; whereas under the discussion draft, again if I read it correctly, the T. & E. facility begins to operate at about the time the licensing proposal is submitted. I think that is a disadvantage.

I also think—although a political scientist, I am not a politician and you gentlemen are—that a State which has a T. & E. facility at a "potential site" may experience the camel's-nose-under-the tent syndrome. I don't think that is good for the program.

As to cost. When the IRG was considering this informally we played around with the notion of an excise tax of about one mil per kilowatt-hour, and we found that that generated an enormous amount of revenue that could be used for repository development. The USGS has indicated that to characterize 26 sites would cost on the order of $1.5 billion. Now that is a lot of money, but relative to the value of the electricity which is produced it is a very small amount of money.

So I don't think cost should be a driving force on this kind of consideration.

Mr. LUNDINE. Do you think the Department of Energy could take several sites and do an adequate job?

Dr. METLAY. Yes. I think it can. In fact, I would argue that one way for them to do that would be to have competing scientific teams at different sites, have, let's say, Sandia develop one site, Lawrence Livermore Lab another.

Mr. LUJAN. Los Alamos.

Dr. METLAY. Los Alamos, whatever, and have them compete. I wouldn't want to forget Los Alamos. I would have competing scientific teams involved in this process. I think the end result might be salutory.

Mr. LUNDINE. And as a political scientist you don't envision that having these many sites might form coalitions which would try to defeat the entire idea of the program effectively.

Dr. METLAY. I can't promise you that, but I think there is some reason to believe that people will feel that this extensive characterization program reflects a deep concern for the technical and scientific integrity of the program.

Mr. LUNDINE. I just want to ask one additional question.

You said that you weren't sure of the organizational infrastructure or stability of the Department of Energy. What is the alternative?

Dr. METLAY. Well, I think the alternative would be, after you have a plan which is agreed upon and after you have a stable funding source, to create some sort of a quasi-independent organization modeled along the lines, let's say, of TVA. Such an organization would be financed on the basis of user charges and would be relatively immune to shifts in administrative policy.

Mr. LUNDINE. Mr. Lujan.

Mr. LUJAN. And would you expand that quasi-governmental organization or whatever to the other functions? Reprocessing? Well, why not? You are coming up with an idea that I happen to like. I think maybe that's what we do.

Dr. METLAY. I think, at least as the question of waste management has evolved, it has been a Federal responsibility. I do not see reprocessing as a Federal responsibility.

Mr. LUJAN. But you are talking about putting together some kind of an organization that would be outside of Government, as I see it anyway as I am following the testimony.

Dr. METLAY. Well, quasi-governmental.

Mr. LUJAN. But basically outside the Government to be the operator of permanent storage. But following further on that is that maybe this organization could do other things at the back end of the fuel cycle, just shift that responsibility over and have it financed by private industry.

Dr. METLAY. If you are asking whether it is possible, I guess my answer would be yes; if you are asking me whether I think it is desirable, my answer probably would be no.

Mr. LUJAN. Why? Is that because you don't support reprocessing or some part of the back end?

Dr. METLAY. The basis is again that I see waste management as a legitimate Federal governmental responsibility because of the health and safety implications. I see reprocessing as something which probably will either happen or not happen depending on the economics of it, and that, I guess, is my view of the way it should be.

Mr. LUJAN. I kind of see it a little different. I see it as being essential to packaging what you are going to put into it. We have tried to do exactly what you are saying. We may be off in some areas, the deadlines, for example, some that you have pointed out probably cannot be met and you can always figure on some slippage. The one particularly that you mentioned, 1 year of operation of a T. & E. facility before we start the permanent repository; however, there is a 7-year period of operation of the T. & E. facility before the licensing of the permanent repository.

Dr. METLAY. Not the construction license; the operating license.

Mr. LUJAN. The operating license, yes.

Dr. METLAY. It seems to me some of the data you would want from the T. & E. would be useful at the operating licensing stage.

Mr. LUJAN. Well, that's what I am saying. The construction is probably what you meant.

Dr. METLAY. I'm sorry. The construction license.

Mr. LUJAN. Another one of the suggestions, because we had exactly what you are saying in mind, are the $3 million and the $10 million payments. The $3 million was to finance the State portion of their participation; the $10 million, in my mind at least, was exactly for what you aresaying, and perhaps we ought to specify what it is there for. Energy impact assistance is really what the intent is.

The idea of more than one site, it would appear to me that that is the next logical step after we do the first one. But I suppose maybe that is a good——

Dr. METLAY. Could I comment on that?

Mr. LUJAN. Sure. Yes.

Dr. METLAY. Because it does depend on, at least in my view, how confident you are that things will work in a sequential manner; that is, if you do come in with these three sites—Louisiana, Hanford, and NTS—that one of them is going to work. My feeling is that the program has so little slack in it to absorb shock that as a safety precaution, as a safety net, to use a current term, it might be prudent to bring in more than one site for a licensing application. It actually isn't absolutely required, but I would argue that prudence might dictate that to be a sensible thing to do.

Mr. LUJAN. You may be right. My wife sometimes says take off your rose colored glasses, because I'm very optimistic that things are going to work out. If you heard the previous testimony, I felt that it is going to be one of those three sites and now I have no doubt in my mind that it is going to be one of those three. Maybe it is the vantage point that we look at it from.

Dr. METLAY. If you are right, fine. If you are right, there is no problem.

Mr. LUJAN. Let me just ask you one other thing that has begun to float around, this monitored retrievable storage. Some are talking about dry storage on the side of a mountain. Some of us, particularly me, are talking about retrievable storage at Barnwell so that if we do have a big slippage in the permanent repository schedule, we have a fallback position with an MRS. Have you gotten into that? Did the IRG get into that?

Dr. METLAY. My reaction would be as follows: Yes, some sort of storage capability is very useful for accommodating slippages in the program, and also, I think, as a way of reducing pressures for a premature decision on a repository. I think, and here my IRG experience probably reflects itself, that the primary responsibility for storage of fuel in whatever mode ought to lie with the utilities. I don't preclude a Federal role, but I think the primary responsibility should be with the utilities.

I think, further, that it is absolutely essential that there be a strong commitment backed up with this front-end financing to a program of geologic disposal. I think to push a program for storage absent such a clear commitment would rekindle the days of the RSSF, which I don't think anybody really is interested in doing.

Mr. LUJAN. Let me ask one final question. I know that that bell rang, but we are under no constraints now. We are out of session.

On the whole reprocessing issue, you say that economics should dictate it. I guess in the final analysis that might be what is going to dictate whether we go into reprocessing or not. But there might be a Federal role, an advantage to doing reprocessing by the Federal Government if the utilities because of economics choose not to. The advantage is, first of all, conserving resources for some day when we don't have it. Or second, in a State like mine where uranium mining goes on, reducing the need to mine the beautiful mountain country. I have a favorite fishing hole there and it bothers me, you know, that they start any kind of mining activity there.

Dr. METLAY. Is that a rhetorical question or one you would like a response to?

Mr. LUJAN. Well, attempt an answer.

Dr. METLAY. As far as energy value is concerned, presumably whether there is any energy value in the spent fuel will be reflected in the economic analysis. So I am not too sure that that is any different. The only argument that is semipersuasive—and I am not a technical person, although I have spent a lot of time around technical people—there does seem to be some disagreement amongst technical people about whether one could package spent fuel as easily as one could package reprocessed waste simply because of the homogeneity of chemical composition.

Now I don't think that case has been made scientifically that you can't package spent fuel adequately. If it could be made scientificially, if a good technical case could be made, then I could see the Federal Government moving into this area. But at least to date I am not aware personally of any strong scientific case that says you have to have reprocessed waste for safety considerations in a repository.

Mr. LUNDINE. One followup question along that line. While you recommend that the reprocessing question be determined based on the economics, would you not think that it would be useful as a part of the plan that you endorse to have a clear statement of Federal policy with respect to whether the Federal Government was going to in fact get involved in reprocessing or not and in a general way what the regulatory policy of the Federal Government would be toward reprocessing?

[No response.]

Mr. LUNDINE. Let me ask you a followup question, having not gotten an answer to that one. Is your hesitancy in this area somewhat like your comment about combining the military waste with civilian? In other words, are you debating between what would be ideal and what is practical?

Dr. METLAY. Yes. My own personal view is that at this point probably reprocessing is not a very sensible thing to do. That is my own personal view.

Mr. LUNDINE. That isn't what I asked, though, you understand.

Dr. METLAY. Yes. To make a policy statement would require the kind of analysis that had not been done in the GESMO proceedings, particularly, in my view, with regard to issues of safeguards. Presumably the NRC could reopen those hearings, as they may very well do, and I would like to see that issue aired in a very forthright way. That's hedging the answer, I admit.

Mr. LUNDINE. Well, I understand. I really didn't mean to interrupt you, but, you see, in writing a bill I tried to do what I thought was ideal, maybe with some regard to what I thought was practical, but if I really felt that defense waste and civilian waste ought to be treated the same, that's the way I would put it in my bill. I fully agree with your analysis that the Bouquard/Lujan bill is eminently more doable and that we are going to proceed along that line, and in fact I think you offered really enlightened testimony here today on that issue that I hadn't thought of, quite frankly, before, that perhaps subsequently some future Congress can address itself to the obvious absurdity of creating the same thing twice.

Dr. METLAY. I think we are kindred spirits with regard to dealing with commercial and military waste.

Mr. LUNDINE. But wouldn't it be helpful if we simply said we are not opposed to reprocessing, the Congress and the President of the United States, but that it is going to be done without Federal subsidy and it is going to be done under a, as certain as we can, regulatory environment? That alone, wouldn't that say something to industry and everybody?

Dr. METLAY. I think that would be better than saying some other things that could have been said.

Mr. LUNDINE. I thank you very much for your testimony.

Mr. LUJAN. Except as a political scientist you know that there are those that would agree with that statement and those who would not, and you get involved in that issue instead of just the one issue of a permanent waste repository.

Dr. METLAY. Yes. Yes. I would hate to see the reprocessing issue sidetrack waste management. I see no technical reason why that should have to happen, and I would hope it doesn't, personally.

Mr. **Lundine**. I thank you very much for those two enlightened corrections of the Lundine bill. Thank you very, very much for your testimony.

Dr. **Metlay**. Thank you very much.

Mr. **Lundine**. The hearing is now adjourned.

[Whereupon at 3:46 p.m. the hearing was adjourned.]

APPENDIX

Written Testimony Provided for the Record by Dr. Kai N. Lee

UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

Institute for Environmental Studies

8 October 1981

Hon. Marilyn Lloyd Bouquard, M.C.
Chairman
Subcommittee on Energy Research and Production
U.S. House of Representatives
Washington DC 20515

Dear Representative Bouquard:

Thank you for inviting me to testify at the hearings you held on legislation relating to high-level radioactive waste management. I apologize for my inability to appear. Unfortunately, the problems associated with nuclear projects 4 and 5 of the Washington Public Power Supply System required my presence at a meeting in Seattle yesterday.

I hope that my written statement, which is enclosed, will prove useful to you and the staff of the Subcommittee in your work on the Bouquard-Lujan bill. As you will see from the statement, I conclude that your bill does indeed provide a useful vehicle for congressional debate, though I do suggest substantial modifications in the proposal.

I am grateful for the opportunity to contribute to the important work of your subcommittee. Please do not hesitate to call if you or your staff have further questions.

Respectfully yours,

Kai N. Lee

Kai N. Lee
Associate Professor
Environmental Studies
and Political Science

Encl.: Statement, with copies
for Representatives Lujan and Lundine.

STATEMENT OF KAI N. LEE, UNIVERSITY OF WASHINGTON

Before the SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
of the COMMITTEE ON SCIENCE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

on the Bouquard-Lujan Bill
(High-Level Radioactive Waste Management and Policy Act)
and H.R. 1993 (Radioactive Waste Research, Development, and Policy Act)

7 October 1981

Madame Chairman, Representatives Lujan and Lundine, and members of the subcommittee, my name is Kai N. Lee. I am associate professor of political science and environmental studies at the University of Washington in Seattle. I have served as a member of the advisory panel on radioactive waste disposal at the Office of Technology Assessment. My research on radioactive waste is supported in part through a Kellogg National Fellowship. Like most academics, I speak for no one but myself.

I am pleased to be asked for my reactions to two bills before this subcommittee, one written by the chair and Representative Lujan, the other by Representative Lundine. Both pieces of legislation address one of the most vexing and persistent questions of our public life: how the nation can manage and dispose of high-level radioactive waste in a safe and timely way.

The legislative process is our premier forum of public debate, the great arena in which to discuss and to settle issues with authority. I mean no disrespect, then, by observing that even Congress cannot decide all the issues at stake in the tangled problem of radioactive waste. Not all national, generic questions can be answered. In particular, augmenting the credibility of the Department of Energy (DOE) or its successor agency is a key element of long-term waste management strategy -- but this is not something Congress can readily effect. Site-specific issues, too, will remain unsettled; it is doubtful that a single nationally prescribed procedural design can be serviceable in all cases -- especially if more than one site is under consideration, and comparisons must be made among candidate sites.

My initial observation, accordingly, is that *no legislative solution is likely to be comprehensive* in the sense of establishing a stable, long-term institutional structure for radioactive waste management. This is not a counsel of despair, but rather a recognition that social choice in so complex and contentious an area will demand repeated consideration from our nation's leaders. The central question, therefore, is what steps can be taken now, to facilitate the evolution of a sensible long-run policy. The analysis I present below has three action implications:

1. *A Defense Waste Trust Fund should be established by legislation.* The events that have eroded the credibility of the national waste management effort have occurred largely as a result of decision made -- or ignored -- in Atomic Energy Commission defense programs. A trust fund, created in the context of the current expansion of defense production capability, would provide long-run support for dealing with military waste, while insulating the defense production community from the uncertainties of civilian radioactive waste management.

2. Mandatory contracts between DOE and the owners of high-level wastes should be the basis of a long-term financing mechanism for radioactive waste management and disposal. Contractual arrangements would provide greater planning certainty to the nuclear industry than the arrangement set forth in H.R. 1993. Universal participation in the national waste-management enterprise from the outset is necessary, however, in order to guarantee fair distribution of costs.

3. A program leading rapidly to an acceptable disposal system design can be initiated, but the design of the institutional framework must have sufficient flexibility to make intelligent use of the knowledge that will be come through research. H.R. 1993 provides such a framework, in the concept of a "mission plan." But a key element of flexibility is timing: decision deadlines should be used sparingly. Setting predetermined lengths of time to complete characterization studies and to finish the siting and construction of a geologic repository both go beyond the levels of technical or social confidence that can be mustered. In addition, judicial review should not be circumscribed until the gains from doing so are clearly in view. I do not see these gains.

This statement presents an analysis that aims at making these recommendations sensible in the context of the Bouquard-Lujan proposal and H.R. 1993.

Assumptions

Let me begin with four assertions:

1. Of the challenges facing radioactive waste management, institutional problems are far more serious than technological ones. Technical questions do remain, and Sec. 3(a)(3) of Bouquard-Lujan bill should begin with the simple statement that "there is reasonable assurance...."

2. Finding a safe means of managing and disposing of long-lived radioactive wastes should be an urgent national priority. The Low-Level Radioactive Waste Policy Act of 1980 demonstrates that effective congressional action on nuclear waste is within reach. But commercial spent fuel and high-level and transuranic defense wastes have yet to be acted upon.

3. It is doubtful that legislation on commercial high-level waste can by itself enhance or restore public confidence in nuclear

electric power. "Solving the nuclear waste problem" entails more than congressional action on commercial wastes; there must be clear progress on the long-neglected military wastes as well.

4. Without decisive action on defense wastes, the real long-term threat to health and safety will persist, and so will public doubts. Permanent isolation of high-level wastes will take decades to complete. While this means that delays of a year or two are unlikely to matter, longer delays are worrisome. What is the probability that this society will lose the capability to care for its radioactive wastes? That is, what is the likelihood of severe economic depression, war, or other large-scale social change -- over the next century? We must fear delay, but for reasons independent of the ones stated in paragraph 3(a)(4) of the Bouquard-Lujan draft.

Two unresolved institutional issues are of fundamental importance. First, an arrangement to pay for long-run management and disposal of wastes has yet to be developed. Current policy assigns responsibility to the federal government to isolate long-lived wastes. Though there is widespread agreement that those who benefit from the use of radioactivity should bear the costs of waste management, there is no payment required now. Instead, governmental appropriations fluctuate -- buffeted by the nuclear controversy -- programs are reorganized, and performance is at best uncertain.

Second, how to regulate waste management activities undertaken by the federal government remains a divisive and conceptually murky question. The Bouquard-Lujan bill and the Administration propose three geologic test and evaluation facilities, to be built by the Department of Energy or its successor to study the engineering feasibility of high-level waste disposal. These would not be licensed by the Nuclear Regulatory Commission. Such an approach may lead to more rapid technical learning, but retard the gathering of institutional experience, which remains the pacing factor.

More generally, the question remains of how to supervise the government waste management enterprise, in light of the track record. Proposals abound: self-regulation by the Department of Energy; regulation by the Nuclear Regulatory Commission; oversight by state governments and others representing populations at risk; adjudication of claims by special-purpose tribunals; and review of management decisions by the President or by one or both houses of Congress. None seems clearly superior, or even adequate to the two somewhat different tasks at hand, ensuring safety and distributing the remaining risks fairly.

The legislative issue is now to design the decision making process for making choices in radioactive waste management. This is the principal concern of the two bills under discussion.

Long-term Funding

The problem of long-term funding of waste management must be addressed in two parts. Defense wastes are generated by the government, in pursuit of national purposes; establishing a funding mechanism to support management and disposal of these wastes is discussed below. Commercial wastes result from sales of electric power, and the cost to ratepayers of radioactive waste management is estimated to be quite modest. The key question is one of institutional arrangements. Should we collect funds from today's consumers to pay for waste management activities that may not take place for a long time, and whose costs -- though small in relative terms -- are difficult to estimate?

H.R. 1993 and the Bouquard-Lujan proposal take different approaches. H.R. 1993 would require payments into a Repository Trust Fund from those who own spent fuel and high-level waste. At the time of disposal, if the payments are determined to have been incorrect, a surcharge or rebate may be provided for. In this funding mechanism the burden of the uncertainty of costs is borne by the owners of high-level waste and spent fuel. Section 15 of the Bouquard-Lujan bill establishes a Nuclear Waste Fund, collected through contracts between the Department of Energy and owners of waste or spent fuel, for the government to provide waste management services. Since entering into such contracts is left to the discretion of owners, the burden of uncertainty is assigned to the government in this approach.

A middle course seems superior to both these designs. From H.R. 1993 one can learn that universal participation must be required, if the costs of research, development, management, and disposal are to be apportioned fairly as they are incurred. Waste management is, as the economists say, a "public good," something from which all benefit. Paradoxically, it is difficult to produce public goods, because no one has an incentive to contribute: if it is available at all it will benefit those who have not paid, as much as those who have.

From the Bouquard-Lujan bill one should adopt the principle of using a contract to establish the schedule of payments and conditions of performance to be met by owners and government. Contractual obligations are legally binding, and thus afford both parties predictability. Yet contracts are normally drawn so that parties can reopen negotiations on provisions, if circumstances change. This flexibility is indispensable when there are significant technical and institutional uncertainties of the kind that prevail in radioactive waste management.

Thus, I suggest that Section 15 of the Bouquard-Lujan bill be modified so that contracts between DOE and the owners of spent fuel and waste are authorized. DOE should offer a model contract within six months of passage, and the agency and owners should be required to enter into a negotiated contract within 18 months of passage. The contracts should have provisions for renegotiation upon demonstration by either party that circumstances warrant.

Paying for Defense Waste Management and Disposal

Background. Radioactive materials have been treated with respect from the beginnings of the nuclear era. But the obviously high costs of controlling *all* radioactive material involved in nuclear weapons manufacture influenced the thinking of the technical community and the quality of the practices instituted. Large quantities of wastes were generated without adequate means of coping with them over the long term. High-level wastes were stored, pending plans for final disposal; and low-level wastes, including those containing long-lived actinides, were released to the environment, contaminating large quantities of soil. "Because the AEC is an operating agency," a respected scientist wrote in 1965, "there has been a tendency to solve storage and disposal problems on an *ad hoc* basis."* By the time he wrote, much of the damage had been done.

The central problem is the waste generated in military programs, now stored as liquids, salt cake, and sludge at Hanford, Washington, and Savannah River, South Carolina. A similar though much smaller quantity of wastes was created in the commercial reprocessing facility at West Valley, New York, and is stored in two tanks there.

Defense wastes constitute a major burden. A committee of the National Academy of Sciences characterized the high-level wastes at Hanford in this way: The most hazardous constituent of high-level waste is strontium-90, an element that resembles calcium chemically and thus can be absorbed into bones. The Hanford Reservation where the wastes are stored is located in the valley of the Columbia River, whose annual flow of 100 billion cubic meters of water makes it the second largest river in the United States. To dilute the strontium-90 in the Hanford wastes to levels considered acceptable for human consumption would require the annual flow of the Columbia for a thousand years.

During the Second World War production reactors at Hanford were used to manufacture plutonium for weapons, including the bomb dropped at Nagasaki. Liquid high-level wastes from chemical separation were neutralized and pumped into steel tanks as a temporary expedient. When the Savannah River Plant was established in 1950 to manufacture special nuc-

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* Abel Wolman, letter to Frederick Seitz, August 11, 1965. On file at the archives of the National Academy of Sciences.

This section is drawn from "Radioactive Waste," a chapter to appear in The Nuclear Almanac, ed. Jack B. Dennis (Reading, Mass.: Addison-Wesley, forthcoming).

lear materials for thermonuclear weapons, the Hanford approach was adopted there too, with some improvements.

By 1963, when planning for the privately owned West Valley facility was begun, problems with tank storage of neutralized liquid high-level wastes were well known within the military nuclear community. Indeed, liquid wastes were stored in acid form at the Idaho Chemical Processing Plant designed in the early 1950s, in order to avoid some of these difficulties. Yet in the commercial nuclear world, outside the curtain of national security, there was little inkling of trouble: in the belief that their choice was a cost-effective one, Nuclear Fuel Services chose to neutralize their wastes.

At each of the sites, some of the steel tanks leaked. Because of their large size, the tanks were built at the site by welding steel plates. The intense heating and rapid cooling produced localized stresses in the metal that left the steel susceptible to corrosion by nitrate salts in the neutralized wastes. Warnings that the integrity of the tanks at Hanford might be compromised came from the U.S. Geological Survey in 1953 and from the General Accounting Office in 1968. By then the leaks had started, capped by a 115,000 gallon leak from Hanford tank 106-T in 1973. Public confidence in the government's ability to contain radioactive wastes was understandably weakened.

Very recently, however, engineering development at two Department of Energy laboratories has led to promising advances. At the Oak Ridge National Laboratory in Tennessee, six small storage tanks holding intermediate-level radioactive sludges are being cleaned out by using remote-controlled high-pressure water pumps. It is estimated that this cleanup will cost $4 million.

Developmental work has also been done at the Savannah River Plant, where there are 24 large high-level waste storage tanks now in service. It has been shown that water sluicing is capable of removing sludge from a 20-year old tank with a record of leaks. DOE has proposed to clean out its other tanks at Savannah River, converting the waste to glass cylinders intended for geologic disposal. This Defense Waste Processing Facility would cost more than $2 billion, and the project would take nearly a decade to complete. The first stage, costing $850 million, is projected for authorization by Congress in fiscal year 1983. Funding for the DWPF must be approved by the defense appropriations subcommittees of Congress. These bodies care most about future military capability. Their willingness to fund a cleanup project costing as much as an aircraft carrier cannot be assumed.

Policy and funding. As the shifting policies on the Waste Isolation Pilot Plant in New Mexico illustrate, the defense nuclear community has been determined to keep any geologic repository for defense wastes at a safe distance from the civilian licensing process. However understandable, the division of radioactive waste management into two disconnected spheres of activity is at best cumbersome, and at worst dangerous. The difficulties -- and now the progress made -- in handling military wastes comprise a two-edged legacy: they include both the longest track record and a body of lessons to be learned. The track record is a troubled one, casting its shadow over all of radioactive waste management. The lessons which could be learned have often not been learned, as illustrated by the sad case of West Valley. Finally, the basic reason for integrating commercial and defense waste management is that the permanent isolation of long-lived wastes from both sectors entails solving the same technological problem.

Earlier this year, the Department of Energy was reorganized so that management of defense wastes is wholly separated from programs for civilian wastes. The trend is not toward integration. As I need hardly remind members of this committee, whether to separate defense and civilian waste divided the 96th Congress and blocked legislative action on high-level waste. What, then, can be done?

The key point is to put defense waste management on a sound footing. For the present, at least, there seems to be a firm commitment to keeping defense wastes away from civilian licensing processes. So the decision making framework is in place. Funding is not secure -- and cannot be, so long as projects like the Defense Waste Processing Facility must compete against weapons systems.

As part of the modernization of U.S. strategic capabilities, production of special nuclear materials is being expanded, and new facilities will be built at Savannah River and other DOE sites. This expansion presents a natural opportunity to launch a dedicated fund, which could be augmented annually in the appropriation for DOE military applications. This Defense Waste Trust Fund would constitute a congressional commitment to a sustained effort to manage and safely dispose of military wastes, but the initial budget obligation would still be modest in relation to the total cost of cleanup. At the same time, the creation of a trust fund would not compromise the separate arrangements for managing defense wastes that constitute the status quo.

I urge the subcommittee to propose a trust fund in Section 4 of the Bouquard-Lujan bill, and to discuss the concept with the armed services committees and the defense appropriations subcommittees in both houses of Congress.

Assuring effective technological communication between the civilian and defense waste communities will be more difficult. The bright side of this circumstance is that two *parallel programs for high-level waste* will be pursued. Each is an institutional backup for the other. The uncertain history of radioactive waste management suggests that having such a backup is sensible.

Decision Making

Two kinds of questions are at stake in siting a radioactive waste repository: factual matters concerning performance and safety, for which *verification* is needed; and matters of fairness, compensation, and due process, for which a *forum for negotiation* is needed. These different kinds of questions frequently overlap, so that decision making processes designed to answer one kind of question -- such as license application procedures designed for factual issues -- can be frustratingly inappropriate for issues raised by the other kind of question.

As the chart shows, there have been a number of institutional arrangements suggested for making choices in radioactive waste policy. *There is no consensus among analysts on which of these may be expected*

INSTITUTIONAL ARRANGEMENT	VERIFICATION ACTIVITY	NEGOTIATION FORUM
No legislation (existing responsibilities)		
DOE	Office of Nuclear Waste Management R&D	Public participation; EIS process
NRC	Licensing process	None
Test & evaluation facility, with parallel repository selection		
DOE	T&E facility; dry storage R&D; Interagency Review Group	Congressional review of plan (1993) or sites (BL); Presidential review (BL)
State and public review		
Consultation and ?	DOE R&D, with State monitoring	Secretarial notice and hearing (BL); Indep. Review and Arbitration Bd., State Review Bds., State Planning Council (1993)

Legend. BL: Bouquard-Lujan bill. 1993: Lundine bill.

(Adapted from Patrick Windham, "Making Consultation and Concurrence Work," unpublished paper, Institute of Governmental Studies, University of California, Berkeley, 1980.)

FUNCTIONAL ARRANGEMENTS FOR RADIOACTIVE WASTE DECISION MAKING

to work better than others. Thus, Congress has little guidance and considerable latitude in choosing an institutional design. Nonetheless, it is important to provide the conditions for good decision making. Three points are worth noting.

First, the concept of a "mission plan" employed in H.R. 1993 recognizes that the development of a national radioactive waste management policy depends upon orderly learning. A mission plan approach seems to be less decisive than a congressionally mandated schedule for action, but it provides a crucial strength: *lowering the likelihood of program failure.* By contrast, pursuing the search for a repository while simultaneously building a test and evaluation facility raises a host of questions: might the T&E facility lead one to investigate a geologic medium not being studied in the repository characterization program? If not, what is being tested and evaluated? or is the T&E facility no more than a symbolic demonstration of seriousness?

The mission plan design of H.R. 1993 is preferable to the T&E/repository approach in the Bouquard-Lujan bill. A detailed analysis of the mission plan concept is contained in a forthcoming report to Congress by the Office of Technology Assessment. I should point out, however, that the rigid schedule of program execution set out in H.R. 1993 makes it unnecessarily brittle. It does make sense to *set a firm deadline for the completion of the mission plan;* since that planning effort will itself provide new information, however, *it is not useful to set deadlines beyond the mission plan.* Doing so invites surprise and disappointment.

A second way in which institutional design can improve decision making is to provide incentives for good analysis, especially when the sponsoring agency accords less importance to an issue than desirable. This is, indeed, one of the central reasons for the impact statement requirement of the National Environmental Policy Act of 1969. Environmental impact statements have gained a reputation as an onerous regulatory requirement. While there is some truth to the complaints about the NEPA process, the benefits to government decision making of impact statements are real and, in my opinion, justify the work of producing them.

In the radioactive waste arena, the key point is that controversy is likely to be intense, especially once sites for permanent disposal of wastes are identified. The sponsoring agency will not have paid attention to everything that potential opponents want analyzed. The call for analysis will, to a degree, be a delaying tactic. But it is difficult for the sponsoring agency to draw the line between justified queries and make-work. This is precisely the situation in which judicial review can improve the chances that the program will be successful in the long run. Thus, the limitations on judicial review in Section 14 of the Bouquard-Lujan bill, particularly the definition of "final decision or action" in Sec. 14(a)(1), encourage decision making that is incomplete or incautious. Section 14 should be removed.

A third issue that has been discussed is whether to authorize a legislative veto of Executive Branch plans to site a repository, and, if so, whether the veto should require the disapproval of both houses of Congress or only one. Those seeking to build repositories quickly advocate either no veto at all, or a two-house veto. I believe a veto provision is necessary, so that an open, legitimate debate can be held, on a national choice having local impacts perceived to be profoundly important. It is important to consider how the veto mechanism might affect the quality of the decision made. Legislative vetoes are exercised in a partisan political setting; the party controlling one or both houses of Congress typically seeks to check the decisions of the President. When control of Congress is divided, as it is now, partisan competition can be intense.

A national waste management policy must weather political change. In particular, which parties control which house of Congress and the Presidency should not be a decisive factor in the choices that are made. The configuration of party control is likely to change before any given siting decision can be fully implemented. For this reason, requiring a two-house veto would seem desirable. The Bouquard-Lujan bill would establish a one-house veto for siting, while H.R. 1993 proposes a one-house veto of the overall mission plan.

In sum, the institutional design of radioactive waste policy should reflect the uncertainties that must be addressed before a national program that is technically sound and socially acceptable can emerge. Legislation should call for a program plan, of the sort outlined in H.R. 1993. Legislatively defined deadlines should be used sparingly beyond the production of the plan itself. And the bodies empowered to review or veto Administration decisions and plans should be structured so as to encourage reviews on the merits, rather than on the basis of partisan political considerations alone.

Bouquard-Lujan and H.R. 1993 both provide workable vehicles for congressional action on high-level waste disposal, though I have suggested substantial changes in both bills. Analysis cannot provide clear guidance on some major elements of institutional design, such as which kinds of special bodies -- if any -- should be assigned authority to review plans and sites. Here, the guiding principle should be experimentation and flexibility. Ultimately, Congress itself must be the guardian of the public interest in this vexing arena of policy. I offer my continued support as you work toward a design: my expectation is that whatever legislation emerges from Congress will need subsequent editing. It is time to offer a draft in earnest.

NRC Comments

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

OCT 2 1981

The Honorable Marilyn Lloyd Bouquard
Chairman, Subcommittee on Energy Research
and Development
Committee on Science and Technology
United States House of Representatives
Washington, DC 20515

Dear Madam Chairman:

Due to the press of business currently before the Commission, it will be unable to appear at next week's hearing on the comprehensive nuclear waste management issues embodied in H.R. 1993 and in the Bouquard/Lujan legislative proposal, a draft copy of which has been received by the Commission.

Instead, the Commission will contribute to your record by providing its comments to the Subcommittee by October 14, 1981.

The Commission shares your concern about moving forward with the nation's nuclear waste management program and appreciates this opportunity to provide comments on these important proposals.

Sincerely,

Carlton Kammerer

Carlton Kammerer, Director
Office of Congressional Affairs

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

October 13, 1981

The Honorable Marilyn L. Bouquard, Chairman
Subcommittee on Energy Research and Production
Committee on Science and Technology
United States House of Representatives
Washington, D.C. 20515

Dear Madam Chairman:

In my letter to you dated October 2, 1981, I indicated that the Commission would provide comments on H.R. 1993 and on the draft Bouquard/Lujan comprehensive nuclear waste management legislative proposal by October 14.

Pursuant to that commitment, I am enclosing for the information and use of the Subcommittee comments prepared by the NRC staff on both H.R. 1993 and on the draft Bouquard/Lujan legislative proposal. The Commissioners have not had an opportunity to review fully these comments nor to prepare further views of their own. Accordingly, the Commission or individual Commissioners may wish to supply additional comments at a later time.

Sincerely,

Edward Fay

for Carlton Kammerer, Director
Office of Congressional Affairs

Enclosure:
As stated

cc: The Honorable Manuel Lujan

COMMENTS ON MAJOR PROVISIONS OF DRAFT LEGISLATION

SECTION 2 -- DEFINITIONS

Section 2(5): Definition of "disposal," page 3, line 4.

To clarify that emplacement is to take place in a nuclear waste repository, staff suggests that the words "in a nuclear waste repository" be inserted after the word "waste" on line 5.

Section 2(17): Definition of "Test and Evaluation Facility" or "demonstration facility," page 5, line 24.

To assure that the intent of this definition conforms to the capacity limits set forth in Section 10 on test and evaluation facilities, staff recommends that the words "limited-capacity" be deleted and the words "with a capacity for receiving a minimum of forty and a maximum of three hundred full-sized canisters of solidified waste" be inserted after "underground cavity" on line 1 of page 6.

Section 2(18): Definition of "transuranic waste," page 6, line 7.

The words "and with radioactive half-lives greater than five years" should be added at the end of the sentence to assure that waste materials with hazards of such short duration do not have to be disposed of in the same manner as the very long-lived transuranic wastes of most concern.

Section 2(20): Definition of "waste package," page 6, line 14.

To provide some additional latitude and to avoid potential confusion and conflicting interpretations, staff recommends that the definition be amended to conform to the Commission's definition in its 10 CFR Part 60 technical rule. The rule defines waste package as the airtight, watertight, sealed container which includes the waste form in which the waste is stabilized and any ancillary enclosures, including shielding, discrete backfill and overpacks.

SECTION 6 -- SITE CHARACTERIZATION

Section 6(a): In General, page 10, line 24.

To assure that the purpose of site characterization clearly encompasses licensed disposal, the words "for purposes of selecting a site for a licensed repository" should be added after the words "characterization activities" on line 3 of page 11.

Section 6(b): Reviews, page 11, line 9.

Staff notes that the Site Identification Report is to contain much of the information required in the Site Characterization Report under the pre-application review procedures of our 10 CFR Part 60 rule. Both reports would also be required at the same stage of site selection. The Site Identification Report thus could serve as a Site Characterization Report if language were added requiring the identification report also to contain "any other information required by the Commission pursuant to its licensing authority." We would recommend that such language be inserted in paragraph (2)(E) on line 17 of page 12.

Section 6(c): Tests, page 12, line 21.

As written, the Secretary could determine the tests he deems necessary to provide the data required for an application to the Commission without reference to the advisory pre-application review provisions of NRC rules. Such advisory review would help assure both that DOE's activities generate the information NRC needs to evaluate the suitability of the site for geologic disposal, and that they do not compromise the licenseability of the site. We believe that our ability to conduct an expeditious license review would be substantially improved by including some provision for the Commission to advise DOE regarding the selection of tests necessary for a complete license application.

SECTION 7 -- REPOSITORY SITE SELECTION

Section 7(b): Submission of Application, page 14, line 16.

Paragraph (A) on line 23 requires DOE to submit to the Commission a license application for construction and operation of a repository. It would appear, however, that the real intent is to submit an application for a construction authorization at that stage. We suggest the following change in line 22: "... Section 8, an application for a construction authorization for a repository...." This same change is also required on line 9 of page 15.

On page 15, beginning on line 4, staff is uncertain what Section 7(b)(2) means. If its intent is to remove existing Commission responsibilities under the National Environmental Policy Act in the licensing of geologic disposal, this intent should be clearly stated.

Section 7(c): Licensing Status Report, page 15, line 8.

It is not clear why the Commission would be required to submit a report to Congress on its licensing proceedings at the same time it is to make a final decision on construction authorization.

Section 7(d): Repository Licensing and Construction, page 15, line 21.

While the 24 month deadline for a decision on construction authorization would be extremely difficult, if not impossible, to meet without using the interim licensing provision, we believe the task would be considerably more difficult if the burden were on the Commission alone to keep itself informed, as is provided in the sentence beginning on line 3 of page 16. We believe this sentence should be amended to require the Secretary to keep the Commission fully and currently informed on Department activities, and to conduct any activities the Commission may request to minimize the time needed for application review.

Section 7 (d)(3)(A)(ii) on page 17, line 18, would enable the licensing hearing board to consider only those technical issues affecting construction or operation of the repository. Critical issues affecting decommissioning or long-term post-operational safety could thus go unexamined, even during hearings on license amendments to decommission or terminate the license for the facility. Also, the hearing board could expend appreciable time simply to determine whether the effect of the dispute is "direct." Staff therefore recommends replacing the entire subparagraph with the following language: "(ii) such dispute involves a technical matter affecting the public health and safety of construction, operation, decommissioning, or long-term post-operational performance of the facility which is the subject of the hearing; and".

Section 7 (d)(7)(A) on line 11 of page 19 appears to require the Secretary to complete construction of the repository regardless of the Commission's decision. Staff strongly recommends amending line 11 to begin with the words: "Subject to Commission authorization of construction, and such terms and conditions as the Commission may require pursuant to the Atomic Energy Act, as amended, ...".

Section 7 (d)(7)(C) presents a similar problem on line 20 of page 19; the Commission may have no choice but to issue a license regardless of our safety findings. Staff strongly urges that this be clarified.

In conversation with Subcommittee staff, NRC staff was unable to ascertain the rule to which subsection (9)(A) is intended to apply on page 20, line 15. Subcommittee staff indicated that the most likely subject is the repository performance standards to be promulgated jointly by NRC and DOE under Section 10(g)(4). If this rule on performance standards is to dispose of all "issues resolved by such rule" for purposes of the Commission's proceedings, as Section 7 (9)(A) provides, the question of deciding what issues the rule has in fact resolved could itself become an additional matter of time-consuming argument.

Under Section 7 (d)(9)(B), in order to make sure that the DOE environmental impact statement is suitable for use by NRC, we would recommend that DOE be required to obtain NRC concurrence on the scope, outline, and the alternatives to be evaluated. Further comments are made in our comments on Section 9.

On Section 7 (d)(11), we would like to note that our ability to meet the requirement to issue our regulations within six months after enactment may not be possible in the absence of the EPA generally applicable environmental standards. If EPA issues its standards soon, we believe we can meet the date. This is discussed further in our comments on Section 9.

SECTION 9 -- GOVERNMENT AGENCY ACTIONS

Section 9(a): General, page 31, line 23.

If the Commission is to be able to conduct expeditious licensing proceedings, it will need a complete license application with adequate supporting information addressing the issues we believe we will have to resolve to meet our licensing criteria. Much of the information developed in the DOE NEPA review would also be required to evaluate the safety aspects of the repository. It would be most helpful, therefore, if paragraph (a)(3) on avoiding duplication of NEPA effort could have a provision in which DOE would agree to examine in its EIS the major issues and alternatives identified by NRC in comments on the scoping of the document. Appropriate language could be added on line 14, page 32.

Section 9(b): Environmental Protection Agency, page 32, line 15.

We are concerned about the current absence of the generally applicable environmental standards from EPA, which EPA has been developing for a number of years. They have not even been issued in draft form for public comment. In their absence, we have been using internal EPA working drafts which have been essentially the same for the past two or three years. If the EPA standards are not issued soon, or they change significantly from their current drafts, it would greatly complicate our ability to meet the six-month deadline for promulgation of our rules as specified in Section 7 (d)(11) of the bill.

SECTION 10 -- RESEARCH AND DEVELOPMENT ON WASTE DISPOSAL

Section 10(b)(2): Operation, page 33, line 14.
Rather than using in situ tests to "develop reliable models," a more accurate description would be "evaluate and improve models".

Section 10(d): Limitations, page 35, line 1.

The staff is pleased at what it believes to be the intent of this provision for NRC authorization before the Test and Evaluation Facility (TEF) can be used for disposal. Since the Commission would also use its authorities under the Atomic Energy Act and the Energy Reorganization Act to make a decision on authorization for disposal, however, staff suggests that the words "and otherwise applicable law" be added to the end of the sentence on line 3.

Section 10(e): Engineered Barriers, page 35, line 8

The provision under subparagraph (1) for comparability of hazard to uranium ore could be interpreted to require a design life for engineered barriers far in excess of the thousand-year requirement in proposed NRC technical criteria. This in turn could involve the Commission in extended litigation over whether engineered barrier design lives of hundreds of thousands of years can be demonstrated to be achievable for licensing purposes. Staff recommends that this paragraph be deleted after line 9 and amended to read: "The system of engineered barriers and selected geology shall have a design life at least as long as the Commission shall require by rule."

Section 10(g): Nuclear Regulatory Commission Role, page 36, line 11.

The provision under paragraph (g)(4) for a written NRC-DOE understanding for interagency agreement and rulemaking on performance standards appears to cast doubt on the future status of the technical criteria and other performance requirements currently the subject of NRC rule-making. Conversation with Subcommittee staff has confirmed that the performance standards for the waste package and repository design are intended to cover repositories as well as the TEF, and Congressional enactment of an alternative mechanism to resolve interagency differences could be read as a disavowal of the normal rulemaking process for this case. The requirement for an understanding with DOE on peformance standards for the waste package, repository design, and all "major unresolved safety issues" for repository licensing under subparagraph (g)(4) could have far-reaching implications for NRC's relationship with DOE in subsequent licensing proceedings. It could effectively establish DOE as a co-equal in the development of the requirements under which it would subsequently be licensed. If the joint promulgation of standards as provided in this subparagraph is to be the rulemaking to resolve technical issues for purposes of Section 7(d)(9)(A), DOE would also have a major opportunity to determine the issues to be considered off limits in a license proceeding. We cannot support this feature of the bill.

The termination of NRC's consultation and cooperation role in the TEF under subparagraph (g)(5) may prove to be premature. Even if another site is chosen for the first repository, the TEF site could become a candidate for licensed disposal later if the first site is found unsuitable or is prematurely closed. In addition, there may be a great deal of generic information being developed which would be useful in the evaluation of a repository at another site. This termination provision thus appears to conflict with the requirement in Section 7(d)(1) that the Commission keep itself "fully and currently informed" prior to receiving a license application. We recommend that it be deleted.

Subparagraph (g)(6) appears somewhat ambiguous. Although it provides that all demonstration facilities be built and operated as research and development facilities, which are unlicensed under Section 202 of the Energy Reorganization Act, subparagraph (g)(6) uses the word "demonstration," which does not appear in Section 202, and the subparagraph does not explicitly stipulate that these facilities shall not be licensed. If such exemption from licensure is the Subcommittee's intent, it should be made plain.

Section 11: RESEARCH AND DEVELOPMENT ON SPENT FUEL

Section 11 would direct the Secretary to establish a research and development program for transitional dry storage of commercial spent fuel in Department facilities. Specifically, the Secretary is to identify available space in existing DOE facilities (e.g. reprocessing plant canyons) that can be adapted for safe, dry storage. To provide a variety of development and demonstration experience, the Secretary is directed to identify at least two such facilities if space in these facilities is reasonably adaptable. DOE would then prepare the selected facilities to accommodate at least 100 tonnes of spent fuel initially, with capability for later expansion to not more than 500 tonnes for testing of dry spent fuel storage in galleries.

This provision of the subject bill for development and testing dry storage of spent fuel in galleries in existing DOE facilities is similar to the provisions in HR 7418 introduced last year by then Congressman McCormick. The proposal has been scaled down somewhat since HR 7418 would have required at least two facilities capable of at least 500 tonnes of commercial spent fuel while the present bill would limit the selected facilities to not more than 500 tonnes.

We suggest that Congressional intent on licensing be made explicit and that, if NRC licensing is not required, Congress require DOE to consult with NRC on the design, construction and operation of such facilities since such facilities and/or technology might be subject to licensing at a later time if the testing program is successful.

Section 12: WASTE SOLIDIFICATION AND PACKAGING

The staff applauds the Committee's support over the years for a strong R&D emphasis on engineered barriers. Unfortunately, in the NRC staff's view, the DOE waste management program has not made as much progress (particularly in the waste package area) as we believe is necessary. We would urge some emphasis on increased R&D in this area so that high integrity packages at a reasonable price can be available when needed. The staff recommends that such a feature be built into Section 12.

NRC STAFF COMMENTS
ON
H.R. 1993
THE RADIOACTIVE WASTE RESEARCH, DEVELOPMENT, AND POLICY ACT

This bill would require the Department of Energy (DOE), in cooperation with the Nuclear Regulatory Commission (NRC) and other federal agencies, to prepare a comprehensive mission plan for the disposal of high-level radioactive wastes (HLW). A detailed process for the implementation of the plan is also provided. NRC finds much to commend in the plan's systematic approach to the identification and resolution of major problems in the national waste management effort. We believe that such an approach should significantly improve the likelihood for solving a number of the institutional and management problems associated with the national high-level waste disposal program.

There are several potential problems in the bill, however. Among the potential problems is a provision for a preliminary license application, and some of the deadlines for Commission action need to be updated. NRC staff is also concerned that the proposed arbitration of state-federal disputes by an independent board could adversely affect the scope and independence of subsequent NRC licensing reviews.

The implementation of the mission plan calls for DOE designation of sites for repositories -- two by 1987, and all remaining sites called for under the plan by 1991. Before DOE can designate a site, however, it must have submitted a "preliminary license application" to NRC and solicited NRC comments on whether DOE should proceed with further consideration of the site for the proposed facility. It is not clear how the "preliminary license application" is related to the pre-application review procedures set forth in our 10 CFR Part 60 licensing rule, nor whether the Commission would have to revise its rule to provide a more formal procedure for a preliminary application.

It is clear, however, that even without additional rulemaking for preliminary applications, the Commission could not meet the proposed deadline of October 1, 1981, for the promulgation of criteria for reviewing applications for intermediate scale and permanent repositories. The portion of 10 CFR Part 60 setting forth technical criteria and performance objectives for licensed geologic disposal was published as a proposed rule last July, and depending on the nature and extent of public comments, we expect to promulgate the rule in final form sometime next year.

We are concerned about the provisions for an arbitration board to assist the state in obtaining information and resolve its disputes with DOE during the early stages of NRC license reviews. Under the bill, DOE's designation of a site for repository construction would take effect automatically after 30 days unless a state or tribe objects, at which point the bill provides for an "Independent Review and Arbitration Board" composed of Presidential, State Planning Council, and Congressional appointees, the latter from House and Senate Committees with jurisdiction over nuclear waste disposal.

Using its authority to require information from any federal agency and invoking subpoena power if necessary, the Board is to determine whether DOE's site characterization activities, characterization report, environmental impact statement, repository engineering design, designated waste forms, and waste packaging technologies are "adequate," that is, whether they "fully address" those concerns of the state or tribal review board that the Arbitration Board finds significant. If the Arbitration Board finds DOE's designation of a site inadequate for any of the reasons cited in state or tribal objections, the Board must identify what DOE must do to correct the inadequacies. The Board's determination would be final and judicially unreviewable.

These provisions appear to us to be likely to lead to duplicative proceedings on essentially identical issues -- first, evidentiary hearings before the Board, and second, licensing proceedings before the Commission. In each proceeding, the basic question would be the acceptability of the proposed repository in terms of public health and safety and environmental considerations. We believe it would be preferable for adjudicatory proceedings to be conducted exclusively by the NRC. If an independent review by a body composed along the lines described in Section 105 is deemed appropriate, we believe that such review (limited to submission of briefs and oral arguments) should take place after the Commission has made its determinations with respect to issuance of a construction authorization, as provided in 10 CFR Part 60.

We express additional concern about the provisions that determinations of the Board are to be final and not subject to judicial review. This could be construed to mean that such determinations shall be given binding effect by the Commission on principles of collateral estoppel. The Commission cannot accept responsibility for making licensing decisions unless it has the authority to make independent determinations with respect to matters relevant to those decisions. We doubt that Section 105 was intended to limit the Commission's discretion, but we think that the matter should be clarified.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
COMMISSIONER

October 9, 1981

MEMORANDUM FOR: OCA

FROM: John Ahearne

SUBJECT: H.R. 1993 - RADIOACTIVE WASTE RESEARCH, DEVELOPMENT, AND POLICY ACT

The following are my comments on H.R. 1993 that I would like addressed in the Commission's comments.

- Sec 7(d)(6), p. 19, lines 4-7: According to OGC ". . . a prima facie evidentiary showing . . ." means that the potential intervenors are required to "prove" that they are right first. I believe this is too restrictive. The "prima facie evidentiary" standard should be replaced by requiring a showing that would require reasonable minds to inquire further. I would also strike the requirement for an affidavit from persons having personal knowledge of the facts because this appears to be too high a threshold.

- Sec. 7(a)(2)-(4), pp. 16-18 and 7(d)(10)(A) & (B): This is the "hybrid" concept proposed in the Senate Bill for spent fuel storage expansion proceedings. I would urge it be used in several proceedings so that the NRC can develop satisfactory procedures. It should not be tried for the first time in the repository proceeding. In addition, I believe the interim licensing provision is wrong for the extremely controversial and very significant first repository.

- Sec. 8(e)(2), p. 31, lines 3-4: ". . . the lawful decisionmaking deadlines for the agencies concerned." We should take exception, and note that the Commission should not be included.

- Sec. 10(e) Engineered Barriers, p. 35: The performance requirements of engineered barriers for a TE facility would be very much different from those for a permanent repository. Is this subsection meant to indicate that the TE facility would be expanded into a full repository? We should seek clarification of the intent.

- Sec. 10(g), p. 36: Note that "concurrence" is not part of the Commission's role on the TE facility. We should suggest the Senate language.

- Sec. 10(g)(6), p. 38, lines 15-18: We should seek clarification of the intent of this paragraph. As written, it is ambiguous since (1) there are no demonstration waste facilities mentioned in Section 202 and (2) the R&D facilities in 202 are for waste generated by the Administration (i.e., defense waste).

- Sec. 15(b), p. 45: An imposition of such licensing conditions is inappropriate until the DOE receives a license to operate the repository or, at least, construction authorization for it.

- Regarding staff comments on Section 6(b) (page 2 of staff comments):

"Site Characterization Report" is a term used in our regulations, which really is a site characterization plan. Therefore, to clarify our comments and avoid implying the Site Characterization Report is a report on the activities identified as Site Characterization in Section 6 of the bill, we should add the phrase "required by 10 CFR 60.11" after the term "Site Characterization Report."

- Regarding the staff comments on 10(d) (bottom of page 5 of staff comments), I disagree with staff's apparent belief NRC must authorize T&E facilities. The Commission has not agreed with this position.

- Finally, I would incorporate one general comment: The sweeping scope of this bill deserves more time for review than we have had (at least at the Commission level). In particular, one day to review the staff positions is inadequate. Consequently we should describe our comments as preliminary and promise to forward additional comments if appropriate.

cc: Chairman Palladino
Commissioner Gilinsky
Commissioner Bradford
Commissioner Roberts
OGC
OPE
EDO

OTA Staff Comments

FOR THE RECORD: COMMENTS ON THE BOUQUARD/LUJAN DRAFT, "HIGH LEVEL RADIOACTIVE WASTE MANAGEMENT AND POLICY ACT" BY THE STAFF OF THE OFFICE OF TECHNOLOGY ASSESSMENT

SECTION. 2. DEFINITIONS

(5) "Disposal"

If it is the intention of the committee to make a clear and totally unambiguous commitment to the development of a geologic disposal system in which long-term protection is provided by the action of a system of engineered and naturally occurring barriers (as suggested in Sec. 10(a)(3)), the definition of disposal in the draft may need revision since it could encompass emplacement of waste in a surface storage facility that require permanent care and maintenance. The following definition of disposal could greatly clarify the committee's intent and eliminate the current confusion between "storage" and "disposal":

> The term "disposal" means the emplacement of radioactive waste in such a place and manner that permanent isolation will be provided by the action of engineered and naturally occurring barriers, with no need for continued human control, monitoring, and maintenance.

This definition is objective, in that it is based on the design characteristics of the system to which it refers, rather than on the intent with which the waste is emplaced, a subjective criterion which cannot be directly observed from inspection of the facility receiving the waste.

This definition is in accord with the normal English use of the word "disposal" which has the sense of "getting rid of" and giving up control over that which is disposed of; placing waste in a facility that requires perpetual care can not be seen as "getting rid" of it, and can more appropriately be referred to as storage.

The following would be a definition of storage that is consistent with the suggested definition of disposal:

> The term "storage" means the emplacement of waste in such a way that direct human control and access are maintained and the waste can be recovered.

Note that this definition, like the definition of disposal, refers only to the observable properties of the system rather than to the intentions of those using it.

These definitions address what appears to be the basic value judgment to be made: whether or not a system that relies on human control and maintenance to ensure adequate isolation of the wastes is acceptable as an ultimate solution to the waste problem. The bill as it stands is quite ambiguous on this point. If the definition of disposal remains as stated in the draft, it appears possible that the Department of Energy could satisfy most, if not all, the requirements of the bill by constructing a near-surface storage facility that required continued human control and maintenance to ensure adequate permanent isolation of the wastes from the biosphere. If it is not the intention of the committee to retain that much ambiguity, a more precise definition appears to be necessary.

(11) "Repository"

Taken together with the bill's definition of disposal, this definition of a repository would fit a monitored surface storage facility as well as a mined geologic disposal facility. If the alternate definition of disposal is used, it would exclude the former.

SECTION 4. APPLICATION

The exclusion of defense waste repositories from the provisions of the bill may cause concern in some quarters. For example, the State Planning Council in its final report to the President recommended that "the program authorized by Congress should apply to all high-level and transuranic wastes regardless of their source. We will not gain public acceptance for a national repository program if the American people perceive that different programmatic and institutional procedures have been put in place for the disposal of wastes which, from the persective of public health and safety, are essentially the same." At the same time, this exclusion may be needed to break the current stalemate and get on with the job of dealing with the civilian waste problem. OTA's discussions with concerned parties on this subject suggest that such concerns might be alleviated to some (perhaps a considerable) extent if provisions were made to allow those responsible for defense waste management to sign contracts to purchase space in civilian repositories on the same basis as the utilities. This would be analagous to the current situation in which military and civilian space programs are institutionally separate, but in which the military can purchase services (e.g., use of the space shuttle) from NASA. In such a situation, the questions concerning strictly defense repositories would be moot until and unless these responsible for military waste decided to build one of their own.

This approach could be financially advantageous to the defense waste program, which could buy into the civilian program on an annual basis, rather than having to incur the large front end capital costs of developing a separate defense repository system. For the same reason, it could allay some of the concerns of those who think that separation of the civilian and military programs could lead to indefinite deferral of progress on disposal of defense wastes.

Technical reviews to date have identified no technical reasons why defense wastes cannot be disposed of in a repository that is suitable for civilian wastes. To avoid concerns that defense secrets might be revealed in the licensing process for a repository, it may be possible for the NRC to specify the maximum acceptable amounts of each radionuclide that can be contained in a single waste canister for a given repository design, and then to certify - based on a review in which the appropriate level of security is maintained - that the canisters delivered by the defense program to the repository do in fact fall within those limits.

If the committee wishes to allow this option, explicit provisions may need to be included now, since it could have some implications for the design of the repository system that need to be factored into the planning process at an early date.

REPOSITORY DEVELOPMENT SCHEDULE

The major objective of this bill appears to be to remove the nuclear waste problem as an obstacle to the use of nuclear power by taking firm actions that can build public confidence that the Federal waste management program is on track and that the job will get done. The means for accomlishing this is adoption of an accelerated schedule for the activities involved in identifying a first candidate repository site and taking it through the licensing process.

While the proposed program may have the desired effect on public confidence, we observed in our testimony of October 5, 1981 that the program will not necessarily ensure that an operating repository will in fact be available at the end of the process outlined in the bill. Because there is at this time no technical consensus about how sure we can be that a characterized site will survive the licensing process, there is a real possibility that the relevant agencies could meet every deadline specified in the bill, and still wind up at the end of the licensing process with a rejection from NRC and no operating repository. Thus the bill leaves utilities unclear about when they can plan to deliver waste to the Federal government, since there is some uncertainty about when a repository will actually be available, and since there is not an explicit commitment to a schedule for the Federal government to begin accepting waste.

OTA's analysis suggests a modification of the proposed approach that may be even more responsive to the needs and concerns of the nuclear industry in general and the utilities in particular, have greater positive impact on public confidence, and at the same time be more acceptable to those who are concerned that an accelerated schedule could compromise safety. That modification is to make a firm commitment in law to begin accepting waste from utilities on a conservatively estimated fixed and certain date by which we can have great confidence that at least one licensed repository will be available, even allowing for the almost inevitable delays and unforeseen problems. This date would not be the earliest possible date at which a repository might be available if everything went right, but rather a more cautious one that makes ample provision for contingencies, such as might be selected by a private firm that would be held legally responsible for delivering contracted services on that date.

This approach involves a basic shift in focus from speed to certainty and commitment. It is based on the conclusion that a few years more or less in the operation of the first repository is not as important as having a firm (as opposed to open-ended) schedule that is widely accepted as feasible and reasonable in view of the remaining technical and institutional uncertainties about the siting process. This conclusion is supported by recent testimony of Edwin A. Wiggin, Executive Vice President of the Atomic Industrial Forum, on the question of repository scheduling:

> "Over the course of the past three decades, we have seen the projected date for an operating waste repository move from 1970 to a 1997-2006 time frame. Although we believe it possible to shorten this schedule, as do the drafters of S. 1662, the precise date on which a repository becomes operable is not as important, in our opinion, as dispelling the public concern that these continuing delays have created." (Testimony before the Committee on Energy and Natural

Resources and the Subcommittee on Nuclear Regulation of the Committee on Environment and Public Works of the U.S. Senate, October 6, 1981.)

Adoption of a more conservative schedule than that contained in the draft legislation may be as effective, or more effective, at dispelling these public concerns, particularly to the extent that it can gain broader support in the informed technical community as to its feasibility. At the same time, it could give greater assurance to the environmental community that corners would not have to be cut in order to meet the schedule.

The DOE reference schedule for a hard rock repository that was submitted to the NRC waste confidence rulemaking proceeding could provide a reasonable basis for choice of a conservative date to begin accepting waste from utilities at a repository. According to this schedule, the first license application would be submitted by 1988, a decision on a construction authorization reached by 1992, and operation begun by early 2000. It is important to recognize that a repository could in fact be available earlier than this (by 1998) if the first site selected for licensing is a salt site (which reduces the time required to consruct the repository), and if the first site does in fact receive a license. However, a schedule that allows for contingencies, such as rejection of the first candidate site, may be more credible than one which can only be met if there are no unanticipated problems and if the most optimistic predictions of the ease of finding a suitable site turn out to be correct. The DOE reference shcedule for a hard rock repository may provide ample room for contingencies, particularly if adequate resources are also made available to permit an expanded and more redundant multiple site screening, characterization, and licensing program that can ensure that backups to the first candidate site will be available as needed.

Adoption of a somewhat less optimistic schedule than that contained in the draft bill would not in any way represent a weakening of Federal determination to resolve the waste disposal problem, as long as it was accompanied by a firm commitment to begin accepting waste at a licensed repository site on the target date. Indeed, incorporation of such an explicit commitment would represent a strengthening of Federal determination, which could give even greater confidence to utilities and the general public that the job will get done within a reasonable time. In effect, it represents an even firmer demonstration of the Federal commitment to predictable resolution of the waste problem.

One source of increased confidence would be the expanded and more intensive program that would be needed to give high confidence that even a more conservative target date could be met with certainty. While the more redundant siting effort that would probably be required to ensure that at least one licensed site was available by the target date would increase the front-end cost of developing the repository system, the extra cost can be viewed as insurance against the risk of being unable to deliver on a firm commitment. In any case, the provisions in this bill for financing the waste management program through disposal fees collected from the utilities should effectively eliminate resources as a constraint on the program.

The redundancy in the siting process needed to ensure successful licensing of at least one site by a conservative target date should alleviate the concerns of those who fear that an accelerated repository development process could lead to a premature commitment to a less-than-satisfactory site simply because of the lack of any suitable alternative. Thus a firm commitment to a fixed but conservative date for a licensed repository may be able to gain broader support than an accelerated schedule for those actions which (it is hoped) would lead to a repository at an earlier date.

This approach should also be able to avoid some of the potential risks of an accelerated schedule. For example, adoption of a schedule that is significantly different from the one that has been the basis for DOE planning, public discussion, and NRC consideration in the waste confidence rulemaking could create the impression of yet another flip-flop in Federal waste management policy, rather than an impression of stabilization. In addition it could create an impression in some quarters that safety was being compromised, which could in turn lead to continued efforts to delay or change the schedule yet again, as well as to criticisms of the program that could increase, rather than reduce, the doubts of the general public.

Third, an effort to accelerate the schedule of development of a technology and related licensing process for which we have no previous experience increases the risk of real or perceived failures that could reduce, rather than enhance, public confidence in the Federal waste management program. Recent testimony by James F. Devine, Assistant Director of Engineering Geology of the U.S. Geological Survey, is relevant to this point:

> "The types of information needed for site characterization and performance evaluation for licensing are fairly well understood by the interested agencies; however, the time required to perform the tests to obtain this information is uncertain. Neither a repository nor a test and evaluation facility has

> ever been built, characterized, or licensed. Not all of the geologic, hydrologic, and engineering test procedures have been designed and field tested for these investigations. The site characterization phases will be a learn-as-we-go procedure in which we cannot accurately predict schedules. To complicate the scheduling, sociopolitical aspects of state and public participation can also impose unplanned delays in obtaining technical information." (Testimony before the Committee on Energy and Natural Resources, and Environment and Public Works, of the U.S. Senate, October 6, 1981)

Adoption of an accelerated schedule in the face of this uncertainty poses two risks. First, it may lead to premature decisions (e.g., selection of the first candidate site, and NRC action on the license application) which could increase the chances that the final NRC action on the first site will be unfavorable. Considering the great political importance that is being attached to the first repository, the negative effects on public confidence of rejection of the first site could be severe, especially if it had been preceded by considerable optimism about the ease of developing a repository. On the other hand, it could lead to slippages in the schedule if deadlines simply cannot be met, which could call into question the credibility of the entire schedule, particularly if the slippages occur in the early stages of the process.

A final risk of an accelerated schedule is that, to the extent that the feasibility of the schedule is questioned by the technical community and the involved agencies, the responsibility for real or perceived failures resulting from the schedule will be shifted to some extent from the involved agencies to the Congress. This could reduce the extent to which the agencies can be held accountable for progress, compared to a situation in which the agencies themselves have developed and certified the feasibility of the schedule which they are to meet. Adoption of the DOE's estimated schedule for a hard rock repository as the basis for choice of a date to begin accepting waste could ensure that responsibility for the feasibility of the schedule is placed squarely on the implementing agency.

SECTION 5. IDENTIFICATION OF SITES

(b) The proposed schedule could force identification of salt site (from among the candidates in Texas and Utah) before the current DOE schedule of May 1983 which has been the basis for its dealings with the two affected states. This could cause some problems in the relations with those states.

SECTION 6. SITE CHARACTERIZATION

(a) Because of the "learn-as-we-go" nature of the site characterization process for the first sites examined, specification of a strict time limit for characterization could force a choice of the first candidate site for licensing on the basis of inadequate information about which site actually has the best chance of success in the licensing process. Greater flexibility at this stage, while maintaining a fixed target date for the operating repository, could reduce the likelihood of later delays that could result from rejection of the first candidate site.

SECTION 7. REPOSITORY SITE SELECTION

(d) Repository Licensing and Construction.

(1) Reducing the time allowed for NRC consideration of the first-ever application for a construction permit for a geologic repository from the four years now considered feasible to two years may significantly increase the risk that the NRC decision will be negative, either because of limitations in available data and analysis resulting from the accelerated site identification and licensing process, or because of inability to adequately resolve technical issues in the licensing process quickly enough to permit an approval of the site on such a short schedule. It also appears likely to produce substantial opposition, rather than broad support, from those who see the licensing process as the major factor ensuring the safety of the repository development program.

(7) (A) This section appears to assume that the NRC's action on the first license application will be favorable, and a construction permit will be granted. However, there is a real possibility that the first site will be rejected. You may wish to add the phrase "provided that a construction permit has been issued by the Commission," or to modify the introduction of Section(7) to read "within six years after the date on which the Commission has granted a construction permit..."

(C) This section also appears to assume that a construction permit will be granted; and appears to direct the NRC to issue an operating license regardless of whether or not the construction process has revealed new information that would make the site unacceptable as a repository. The latter problem could be avoided by directing the NRC to decide whether or not to grant an operating license.

SECTION 8. REPOSITORY SITING REVIEW AND REPORTS

(a) Consultation and Concurrence.

(2) The committee may wish to consider adding the requirement that written agreements between the Secretary and the Governor of a State with a potential site should include a conflict resolution procedure, in order to maximize the likelihood that disputes will be resolved amicably before they reach a point at which the State would choose to appeal to the Congress.

(b) Repository Development Reports

The committee may wish to consider explicity mentioning state legislatures and affected local governments among those whose views and comments are to be included in the Repository Development Report.

(e) Project Decision Schedule.

This requirement for an explicit schedule for all the actions that must be taken by the involved agencies to develop a repository on time could increase public confidence that the job will in fact get done. As we observed in our testimony submitted to the committee on October 5, 1981, OTA has concluded that rapid development of a credible Management Action Program is one of the most important necessary steps for building public confidence in the Federal waste management program. Our analysis suggests several possible modifications to the proposed legislation that could increase the effectiveness of the proposed legislation in this regard.

*Integrate the Project Decision Schedule with the Program Management Program for the Test and Evaluation Facility (Sec. 10(f)) and the schedule to be developed by DOE in cooperation with NRC as outlined in Sec. 10(g), in a single Management Action Program document that brings together in one place a coherent schedule for all of the technical and institutional actions needed to achieve the objectives of the legislation. The work that has gone into the as-yet-unpublished draft National Plan for radioactive waste management should allow development of a detailed Waste Management Action Plan within about two years, roughly consistent with the projected schedule for development of the Project Decision Schedule. A recent NASA internal review of the sources of cost and schedule overruns in a number of its projects suggests that the time taken to develop a detailed project implementation program is very well spent.

*Require explicit approval of the Management Action Program by the Congress. This could have two benefits. First, it could lend credibility and authority to the program, and the act of approval could itself represent an early major milestone in the Federal waste management effort. Approval could be accomplished either by giving either House of Congress an opportunity to reject the proposed Management Action Program (as provided in H.R. 1993), or by requiring that Congress take positive action to approve it. While the latter approach could increase the risk of delays resulting from failure to approve the plan, it would for that very reason increase the incentives for the Administration to develop a plan that would gain broad support, and could also increase the public stature of the plan once approved.

The second benefit of Congressional approval is that it could increase confidence that an appropriate balance is being maintained between the regulatee (DOE) and the regulator (NRC). The bill as it stands may be seen by some as upsetting that balance by giving the Secretary of the Department of Energy the power to set the lawful decisionmaking deadlines for all of the other agencies concerned, including the NRC. In order to build trust in the Federal government's waste management program in some quarters, it may be valuable to avoid any actions which would create even the appearance of compromising the independence of the Nuclear Regulatory Commission in this area.

SECTION 9. GOVERNMENT AGENCY ACTIONS

(b) Environmental Protection Agency.

As discussed in the written testimony submitted to the committee on October 5, 1981, the proposed schedule for promulgation of final standards by EPA may be unattainable, and in any case could lead to premature commitment to standards which are still the subject of dispute. The alternate approach of requiring rapid publication of the proposed standards for discussion, followed by an extended period of public review (up to a year) to be coordinated with review of the proposed NRC technical criteria, could serve to build public understanding and acceptance of the regulatory standards, while at the same time reducing the likelihood of premature locking in of standards which could require future revisions.

Public confidence in the regulatory process could also be increased by requiring that the final EPA standards be promulgated before the NRC promulgates its final technical criteria which are intended to insure that the EPA standards are met. The current situation, in which the proposed NRC criteria have already been published for discussion, before the same action has been taken for the EPA standards which the NRC criteria are supposed to implement, may raise some questions in the minds of observers about the degree of coordination in the Federal waste management program.

For the same reason, the committee may wish to consider recommending or requiring that a final decision in the ongoing NRC waste confidence proceeding be deferred until after both EPA and NRC final regulations have been promulgated. This could avoid the appearance of inconsistency that could result if NRC were to make a finding about the likelihood of ultimate safe disposal of radioactive waste before it had even made a final decision about what is required for safe disposal. The credibility of the decision in the confidence proceeding could be further enhanced if it were made on the basis of a review of an approved Management Action Program showing precisely how the Department of Energy plans to ensure that at least one licensable site will have been submitted to the NRC in time to provide a licensed repository on schedule.

SECTION 10. RESEARCH AND DEVELOPMENT ON WASTE DISPOSAL

(a) Site and Design

Selection of a site for a Test and Evaluation facility one year before selection of the first candidate repository site creates some risk that the repository site may be different from the one for the T&E facility, and at the same time may raise concerns that early choice of a T&E site and initiation of construction may bias the choice of a repository site. Deferring the start of construction of the T&E facility until after the Secretary's selection of a site for the repository would eliminate these potential problems at the cost of about one year's delay.

(b) Operation

Many of the tests described in this section, particulary those in (2) and (3) related to model devleopment, would be more valuable if they were performed during the site characterization phase, prior to the initiation of the licensing process, so that they could contribute to that process.

The failure mode tests described in (6) may present some risks to the schedule for the licensing process, if not for the integrity of the repository itself.

(c) There is no subsection (c). The subsequent subsections should be renumbered.

(e) Engineered Barriers

Tying the design life of the disposal system to the time required for the radiological health hazard of the wastes to become comparable to the radiological health hazard of the uranium ore raises two possibilities. First, it may impose more stringent requirements than those finally adopted by the EPA and the NRC. The current draft EPA standards would require a demonstration of isolation for a period of 10,000 years, while the most current data on radionuclide toxicity appears to indicate that the hazard of the waste will not decay to the hazard of the ore until after tens of thousands of years. Second, even if the regulatory standards that are finally promulgated impose more strigent requirements than the ore body comparison, further revisions of the toxicity data could reverse that situation in the future. In such a case, the proposed language in this subsection would appear to require a revision of the system design to accomodate such a new data. These possibilities could be avoided if subsection (1) which refers to the ore body comparison were dropped and reference were made only to the officially promulgated regulation standards.

(f) Program Management Plan

See discussion of Section 8(e), the Project Decision Schedule.

General comments on the T&E facility

Many of the objectives of the T&E facility could perhaps be accomplished, and some of its disadvantages avoided, by an alternate approach involving the following elements:

*Earlier performance of those site specific tests needed for thorough site characterization, using hot waste where appropriate, at all of the sites being characterized. This eliminates the appearance of bias in the site selection process; provides more information about each site to allow a better choice of a candidate repository site and to increase the likelihood that it will receive a construction permit; and assures that well-characterized backup sites will be immediately available in the event that the first site is rejected for any reason.

*Rapid development of an integrated storage and disposal logistics T&E facility at a site that is unusable for a repository, as suggested in our written testimony submitted on October 5, 1981. This could provide earlier evidence of progress than would a facility built at a site which would not be identified for three years, and could provide logistics experience in time to affect the repository design submitted at the time of application for a construction permit.

*Use of a modular development process for the repository, in which construction of the repository and emplacement of waste would proceed simultaneously after the construction permit is granted. This could allow emplacement of significant quantities of waste in the repository much earlier than is now contemplated in the proposed DOE schedule, in which construction of the surface facilities and a significant fraction of the underground excavations is completed before any waste is emplaced, a construction process that requires six to eight years depending upon the medium. This would allow early validation at the repository site of the results from the logistics test facility concerning emplacement procedures, in time to make appropriate modifications to the repository system design before completion of the surface and subsurface facilities. Discussions with NRC staff have indicated that this might be quite possible within the context of the procedural regulations that have already been issued. If so, it may be possible to begin emplacement of waste in a repository within about a year of the time contemplated in the schedule for the T&E facility, without raising the same concerns about its potential effects on the licensing process.

SECTION 11. RESEARCH AND DEVELOPMENT ON SPENT FUEL

(1) It is not clear whether the language in this and the subsequent sections is broad enough to include an expansion of the dry surface storage test facility that uses the Engine Maintenance and Disassembly facility at the Nevada Test Site to receive and package spent fuel for emplacement in surface drywells and silos. Such an expansion would allow a pilot scale test of the ability to receive, package, and emplace spent fuel in the sort of dry storage facility that may be needed for surge storage at repository sites, as discussed in OTA's testimony of October 5, 1981.

(4) It is not clear in this subsection whether a utility would have to show that it has no options for preventing loss of full core reserve, and eventual reactor shutdown, before it could qualify to have its spent fuel removed to Federal storage R&D facilities. The proposed language would appear to cover a utility which is technically capable of providing additional spent fuel storage, but has failed to do so in a timely manner, perhaps because it assumed that the Federal facilities would be available as a backup. If it is the intent of the committee that provision of additional interim spent fuel storage capacity beyond that available in existing reactor pools is a utility responsibility, and that the Federal government would accept spent fuel only from utilities which are unable for technical reasons to provide such additional storage, then explicit language to that effect would be helpful. Unless there is a clear resolution of the conditions (if any) under which the Federal government will accept spent fuel for interim storage, utilities may be left with an incentive to defer making commitments to provide their own interim storage capacity in the expectation that the Federal government might provide an alternative later. Adoption of an unambiguous spent fuel policy

appears necessary in order to give the utilities very clear signals about what they are expected to do. A federal commitment to begin accepting spent fuel from utilities at a repository on a firm date in the future, discussed above, could significantly ease utilities' problems in providing interim storage capacity until then.

SECTION 13. STATE PAYMENT

The provision of payments to the States and Indian tribes which can compensate to some extent for the socioeconomic impacts of Federal waste management activities should help to offset the otherwise unattractive nature of a Federal waste facility which is immune to state and local taxation. The proposed fixed payment has the considerable advantage of administrative simplicity, and avoids the necessity for judgments about the validity of claims for compensation. In addition, it gives the recipients great flexibility in how the payments are to be used. The provision in Section 15 that the state payments will be funded by utility fees should give the States adequate assurance that funds for the payments will be available as needed.

One limitation of this approach is that it applies only during the period of operation of a repository, and ceases with decommissioning. Thus, while it provides some compensation for the operational impacts of the repository, it does nothing to compensate for the permanent loss of the repository site from the tax rolls. This could be dealt with by providing for a lump sum payment (perhaps into a trust fund) at the time of decommissioning that would assure availability of annual revenues that could replace the permanently lost taxes revenues. The Committee may also wish to consider adding language that would ensure that as well as states and Indian tribes, localities directly affected by radioactive waste management activities would receive some level of payment.

SECTION 15. PROGRAM FINANCING

(a) Contracting Authority

OTA has concluded that the assurance of adequate and stable funding is central to the credibility of any long-term Federal waste management commitment. The provisions in this section represent an important and very creative step in this direction. The use of mandatory contracts for disposal services as a vehicle for obtaining early revenues from utilities to offset the costs of the waste management program has the advantage of creating a legal obligation for the Federal government to deliver the disposal services as provided in the contract. It also forces careful planning of the anticipated delivery and repository loading schedule, since each contract would presumably specify a date on which the Federal government would take possession of the waste which the contract covers. This planning would be facilitated by explicit commitment in law to a specific date on which the Federal government would begin to accept waste on an operational basis from utilities. Early development of an integrated, comprehensive management action program, as discussed earlier, would provide a solid basis for this planning, and for determining the fee that must be charged to cover the full costs of developing and operating the Federal waste disposal system.

(b) Licensing Conditions

It is not clear that this subsection would apply to reactors which already have operating licenses.

(d) Use of Fund

The ability to limit annual expenditures from the nuclear waste fund via appropriation or authorization legislation may create pressures for deferral of large capital expenditures in years in which the Federal budget is particularly tight. This may be inconsistent with the assurance of predictable annual funding that is needed to ensure that a long-term firm schedule for development of a waste management system can be met.

A possible alternate approach would be to require the development of a detailed management action program that would be explicitly approved by Congress, as discussed earlier. This would give Congress the opportunity to approve a detailed long-term plan for the program expenditures required to achieve the objectives of the act. The responsible agency would then have the authority to make annual expenditures from the fund as provided for in the management action program, while Congress could exercise annual oversight to ensure that the program was being carried out as planned.

ADDITIONAL COMMENTS

The Committee may wish to consider the creation of an Advisory Committee on Repository Safety, made up of individuals with technical expertise in relevant areas such as geology, rock mechanics, hydrology, and system modeling, to fulfill the role in the NRC licensing process that would otherwise be performed by the Advisory Committee on Reactor Safety. This could facilitate the licensing process, and increase public confidence by ensuring adequate peer review of each step of the repository development process.

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